POWERPATH

PS-8 (105531)
PS-8E (100263)
PS-6 (105530)
PS-6E (100262)

NAC EXTENDER POWER SUPPLIES

Installation Instructions

COOPER Notification
273 Branchport Avenue, Long Branch, NJ 07740-6899 Ph: (800) 631-2148 Fax: (732) 222-8707
Web Site: www.coopernotification.com e-mail: info@coopernotification.com

Part Number: P84905-001G
Assembly Number: A84904-001A

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION, AND OTHER INVOLVED PARTIES

This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all as indicated below.

Program feature or option	Permitted in UL 864? (Y/N)	Possible settings	Settings permitted in UL 864
Ground fault detection	Required by UL-864 (Yes)	Enabled: Dip switch 3, switch 1 (Set to the LEFT)	(Yes)
		Disabled: Dip switch 3, switch 1 (Set to the RIGHT)	(No)

Thank you for using our products.

Use this product according to this instruction manual.

Please keep this instruction manual for future reference.

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NOTE: All **CAUTIONS** and **WARNINGS** are identified by the symbol ⚠ All **WARNINGS** are printed in bold capital letters.

WARNING **READ THIS INSTRUCTION MANUAL CAREFULLY. FAILURE TO COMPLY WITH ANY OF THE FOLLOWING INSTRUCTIONS, CAUTIONS, AND WARNINGS COULD RESULT IN IMPROPER APPLICATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

1.0 INTRODUCTION AND SPECIFICATIONS:

1.1 INTRODUCTION

The **POWER**PATH NAC Extender Power Supply is available in two models: the PS-8 and the PS-6. The PS-8 differs from the PS-6 in the NAC output current and in the enclosure size and the PS-8 enclosure can mount up to two addressable control modules. All other features, indicators and capacities are the same.

The PS-8 is an 8 Amp, 24VDC, filtered and regulated, supervised remote power supply/charger used for supervision and expanded power driving capability for Fire Alarm Notification Appliance Circuits (NACs). NAC output options include up to four (4) Class “B”, two (2) Class “A”, or two (2) Class “B” and one (1) Class “A” Notification Appliance Circuits. Additionally, an auxiliary power output can provide constant power of up to 0.24 Amps for 24 hours and up to 0.02 Amps for 60 hours, or managed power up to 2.5 Amps in a non-alarm condition and when AC power is applied to the panel. The PS-8 also contains a battery charger capable of charging up to 33 Amp/Hour (Ahr) of battery backup. The PS-8’s NAC outputs can also be used as UL-1481 Compliant power supply outputs. When configured this way, the maximum continuous current rating is 3 Amps per power supply output and 4 Amps maximum total current for all continuous duty power supply outputs. Primary applications include NAC expansion (supports ADA requirements) and auxiliary power to support system accessories. The PS-8 may be connected to any 12VDC or 24VDC Fire Alarm Control Panel (FACP) by using Notification Appliance Circuits (NAC) or a “Dry Contact(s)”.

The PS-6 is a 6 Amp, 24VDC, filtered and regulated, supervised remote power supply/charger used for supervision and expanded power driving capability for Fire Alarm Notification Appliance Circuits (NACs). NAC Output options include up to four (4) Class “B”, two (2) Class “A”, or two (2) Class “B” and one (1) Class “A” Notification Appliance Circuits. Additionally, an auxiliary power output can provide constant power of up to 0.075 Amps for 24 hours, or managed power up to 2.5 Amps in a non-alarm condition and when AC power is applied to the panel. The PS-6 also contains a battery charger capable of charging up to 33 Amp/Hour (Ahr) of battery backup. The PS-6’s NAC outputs can also be used as a UL-1481 Compliant power supply outputs. When configured this way, the maximum continuous current rating is 3 Amps per power supply output and 4 Amps maximum total current for all continuous duty power supply outputs. Primary applications include NAC expansion (supports ADA requirements) and auxiliary power to support system accessories. The PS-6 may be connected to any 12VDC or 24VDC Fire Alarm Control Panel (FACP) by using Notification Appliance Circuits (NAC) or a “Dry Contact(s)”.

Each NAC Extender Power Supply allows two FACP NAC circuits or two “Dry” contact closures to activate it when connected to the inputs. These inputs can then be directed to control supervision and power delivery to any combination of the four (4) outputs.

Each NAC output is rated at 3.0 Amps (Class "B") or 3.0 Amps (Class "A") and can be programmed to generate a steady or Code 3 Temporal Horn sound, and a strobe output under alarm condition. Total load for the PS-8 NAC circuits shall not exceed 8.0 Amps. Total load for the PS-6 NAC circuits shall not exceed 6.0 Amps.

Each NAC Extender Power Supply, under non-alarm condition provides independent loop supervision for Class “A” and Class “B” FACP NAC circuits. In the event of a loop trouble, the FACP will be notified via the panel steered input (IN1 or IN2). In addition there are common trouble output terminals (used to indicate a loop trouble) and common trouble input terminals (used generically by any initiating circuit).

Wheelock horns/strobes, strobes and horns with synchronizing capability can be utilized with both the PS-8 and the PS-6. Audibles can be silenced with only two wires outputs. Additionally, the **POWER**PATH can provide a temporal coded signal for appliances that can utilize it.

1.2 SPECIFICATIONS

Approvals:

- UL Listed 1481 Standard for Power Supplies for Fire-Protective Signaling Systems.
- Pending: California State Fire Marshall (CSFM)
- Pending: Bureau of Fire Protection (BFP) Chicago
- NFPA 72 compliant
- Environmental: Approved for indoor dry locations.
- FM Approved to ANSI / UL-864 9th Edition Emergency / Alarm Communication Systems.
- Pending: MEA – NYC Dept. of Buildings.

Inputs:

- 240VAC, 50/60Hz, 3.22 Amps (PS-8E), 2.42 Amps (PS-6E) Operating Power in Alarm.
- 120VAC, 50/60Hz, 5.32 Amps (PS-8), 4.25 Amps (PS-6) Operating Power in Alarm.
- 24VDC Sealed Lead Acid Battery Backup Connection.
- Two (2), 12VDC or 24VDC NAC Initiating Circuits (8-33VDC at 5mA).
- Two (2) “Dry” Contact initiating Circuits.
- Accepts two Class “A” or two Class “B” circuit inputs.
- Built in battery charger for sealed lead acid or gel type batteries. Maximum charging current: 0.75 Amps.

Outputs:

- 24VDC power limited synchronized outputs. Up to 50 NAC devices per output, maximum line impedance 1.46 Ohms per NAC.
- 8 Amp in alarm supply current for the PS-8 (6 Amp in alarm supply current for the PS-6).
- Capable of four (4), Class "B" regulated outputs (Maximum of 3 Amps on an output.)
- Capable of two (2) Class “A” regulated outputs (Maximum of 3 Amps on an output.)
- Capable of one (1) Class “A” regulated outputs and two (2) Class “B” regulated outputs (Maximum of 3 Amps on an output.)
- Temporal (Code 3) or constant voltage output generation.
- Built-in Wheelock synchronization mode that can be fed to any or all of the output circuits.
- Input and output can be synchronized with “IN FOLLOWER” mode.
- Continuous duty NON-RESETTABLE output configuration 4 Amps of maximum continuous duty current. (Maximum of 3 Amps on an output for specific applications.) Continuous power outputs are not battery backed up.
- Audible silence capability.
- Filtered and electronically regulated output.
- PS-8 - 0.02 Amp continuous auxiliary power for 60 hours, which is power limited and battery backed up.
- PS-8 - 0.240 Amp continuous auxiliary power for 24 hours, which is power limited battery backed up.
- PS-6 - 0.075 Amp continuous auxiliary power for 24 hours, which is power limited battery backed up.
- 2.5 Amps managed auxiliary power that turns off during alarm or battery backup, and automatically restores.
- Multiple **POWER**PATHs can be synchronized through the SBUS terminals, see Chapter 6.0 on sheet 22 for example drawings.

Supervision:

- Compatible with 12VDC or 24VDC FACP.
- Signaling appliance loops are supervised and steered to either IN1 or IN2.
- 10K Ohm, 1 Watt (Wheelock Model #PSEOL) End of Line Resistor (EOLR) for supervision of all outputs.
- Common input and output trouble circuits.
- Automatic switchover to standby battery when AC fails.
- Short circuit protection with auto reset.
- Input and output status LED indicators.
- AC fail supervision (Form “C” contact, 1 Amp 24VDC).
- Battery presence and low battery supervision (Form “C” contact, 1 Amp 24VDC).
- Ground Fault Detection, with the ability to detect ground faults on individual circuits. Minimum Impedance = 0 Ohms.

Parameter	Description
Operating Temperature	0 to 49 °C (32 to 120 °F)
Storage Temperature	-20 to 70 °C (-4 to 158 °F)
Humidity, Non-condensing	85 ± 5% at 30 ± 2 °C (86 ± 4 °F)

1.3 TERMINOLOGY

CLASS “A” = STYLE Z

CLASS “B” = STYLE Y

FACP = Fire Alarm Control Panel

EOLR = End of Line Resistor

NAC = Notification Appliance Circuit

SM = Wheelock Sync Module with single output

DSM = Wheelock Dual Sync Module with two outputs

C = Common

NC = Normally Closed

NO = Normally Open

Ahrs = Ampere/Hours

Enclosures

Figure 1 shows the location of the PC boards and knockouts on the PS-8 panel.

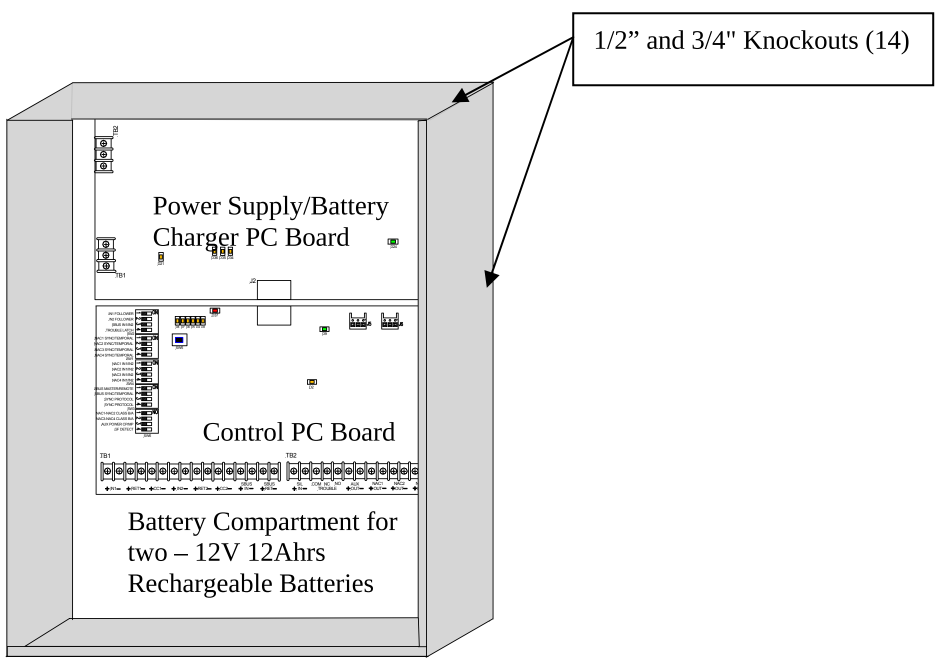


Figure 1: PS-8 Enclosure Layout

Figure 2 shows the location of the PC boards and knockouts on the PS-6 panel.

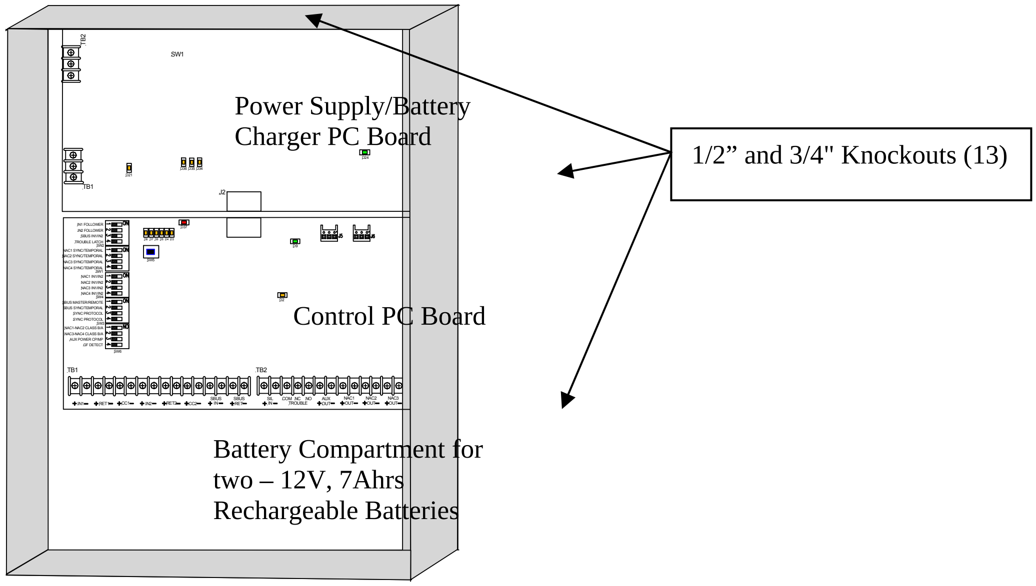


Figure 2: PS-6 Enclosure Layout

2.0 INSTALLATION INSTRUCTIONS:

NOTE: The **POWER**PATH NAC Extender Power Supply shall be installed in accordance with the National Fire Protection Association (NFPA), National Electrical Code (NEC) and all applicable state and local regulations.

2.1 UNPACKING

The **POWER**PATH was carefully checked before leaving the factory. Inspect shipping container and unit carefully for indications of improper handling. If damage is detected, make an immediate claim to the carrier.

Remove the **POWER**PATH from the shipping container and check that the door lock keys, door lock, and battery connection wires are inside. Make sure the printed circuit boards are within their proper packaging of the enclosure.

2.2 MOUNTING

WARNING **TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.**

CAUTION This product is not intended for use in hazardous locations as defined by the National Electrical Code (NEC) and by the National Fire Protection Association (NFPA).

A Mount the **POWER**PATH in the desired location using the mounting dimensions in Figure 3 (PS-8) and Figure 4 (PS-6).

B. Mount the panel in an indoor and dry area that does not exceed a temperature range of 32° F to 120° F (0° C to 49° C) and a humidity equal to 10% to 85% at 86° F (30° C) non-condensing.

NOTE: When mounting on interior walls, use proper screw anchors in plaster. When mounting to concrete, especially when moisture is expected, first attach a piece of ¾ inch plywood to the concrete surface. Attach the **POWER**PATH to the plywood.

C. Remove desired knockouts and mount conduit and conduit fittings to the enclosure.

NOTE: All dimensions shown are measured in inches.

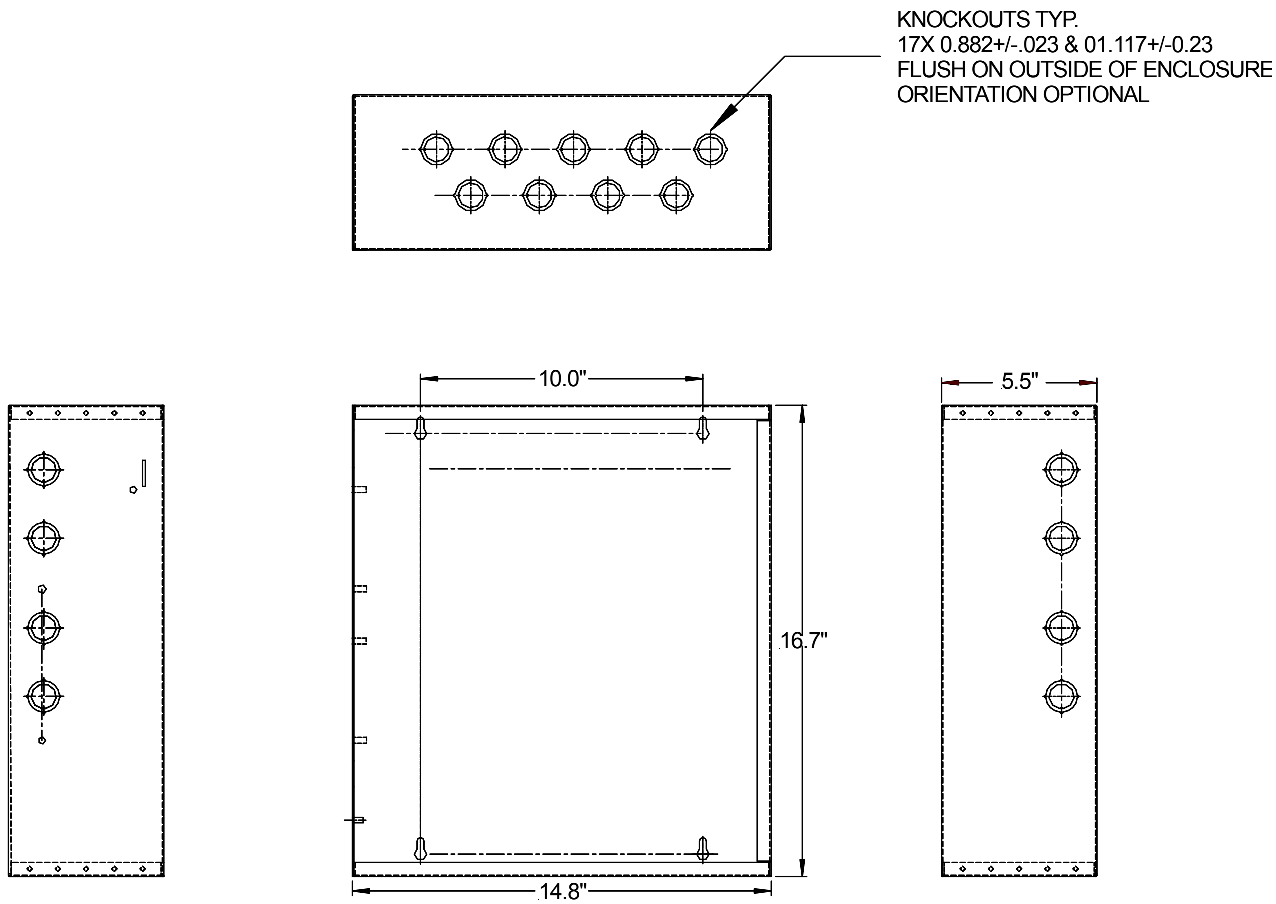


Figure 3: PS-8
Mounting Dimensions
DIMENSIONS (H x W x D) – 16.7" x 14.8" x 5.5"

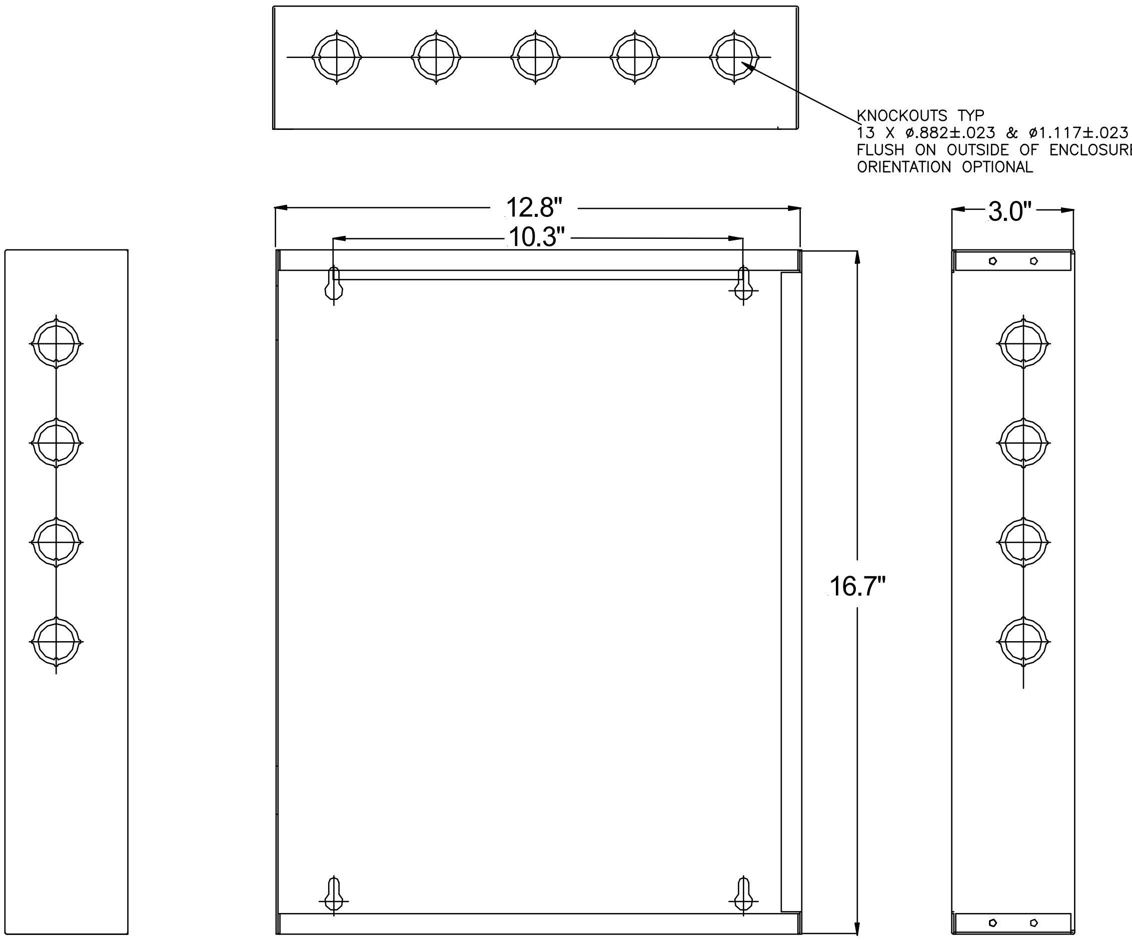


Figure 4: PS-6
Mounting Dimensions
DIMENSIONS (H x W x D) – 16.7" x 12.8" x 3"

2.3 WIRING

Review the Operation Section (4.0) in order to select the proper hook-up and use of the **POWER**PATH.
Set switches and wire the **POWER**PATH as follows: Terminal locations for the Power Supply/Battery Charger PC board are shown in Figures 5 and 6. Terminal locations for the Control PC board are shown in Figure 7.

NOTE: The maximum current on a Class "A" or "B" output is 3 Amps with the rest of the NAC Extender output current divided among the remaining circuits.

DO NOT CONNECT WIRING TO THE AC INPUT SOURCE OR TO THE BATTERIES UNTIL ALL WIRING AND ALL SWITCH SETTINGS HAVE BEEN MADE

POWER LIMITED AND NON-POWER LIMITED WIRING SHALL BE SEPERATED AND SHALL NOT BE WITHIN 1/4" OF EACH OTHER. NON POWER LIMITED WIRE SHALL BE SEPERATED FROM PC BOARDS BY 1/4".

Power Supply/Battery Charger PC Board

NOTE: Sealed Lead Acid Batteries shall be used for backup batteries.

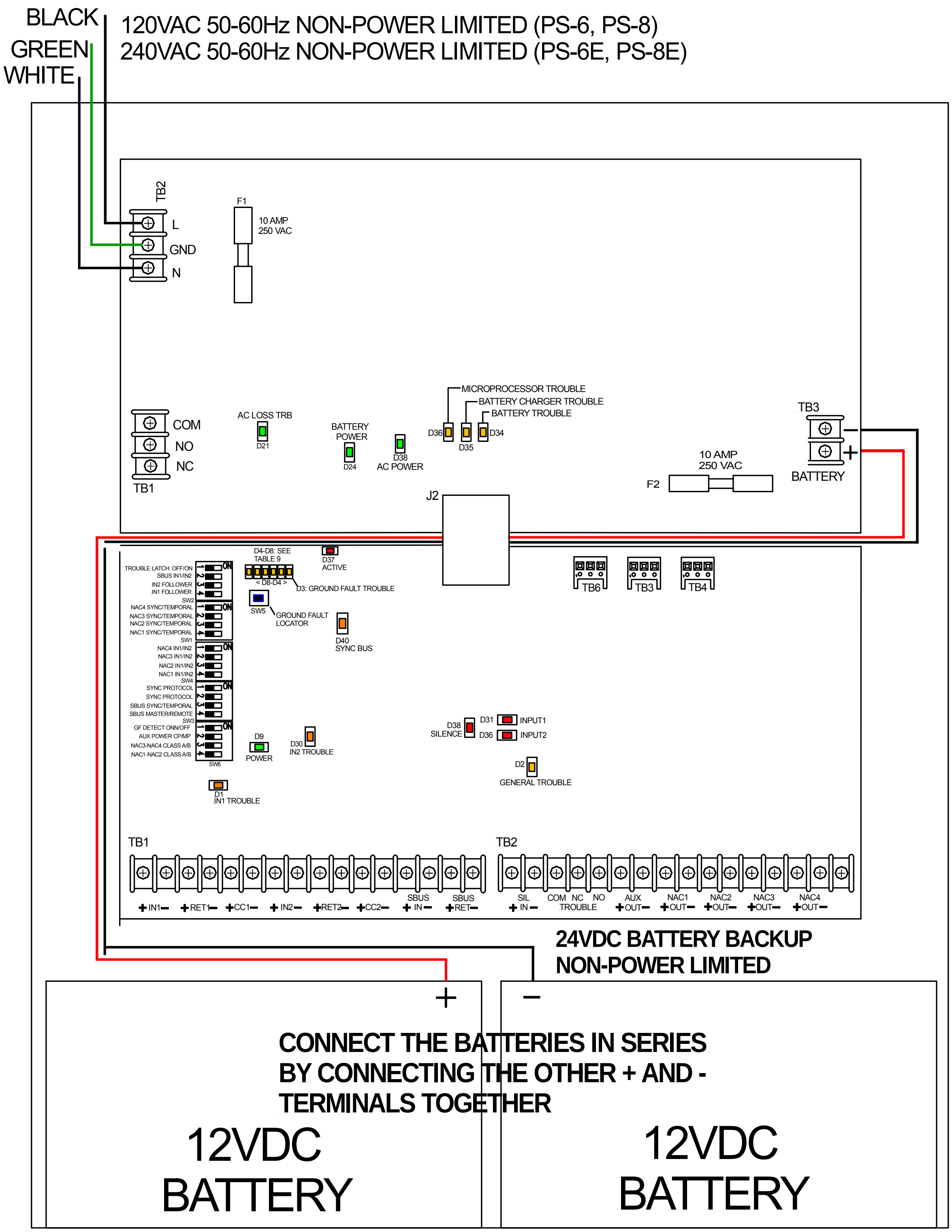


Figure 5: AC and DC Input Wiring Paths

A. Install the battery wires to the battery terminals (TB3) and dress them down to the back of the enclosure, observing ¼” separation from power limited wiring.
B. Wire the AC LOSS terminals as applicable.
C. Install the battery insulation cover plate over the battery terminals, folding side facing the door. Ensure that the battery wires maintain ¼” separation from power limited wiring.

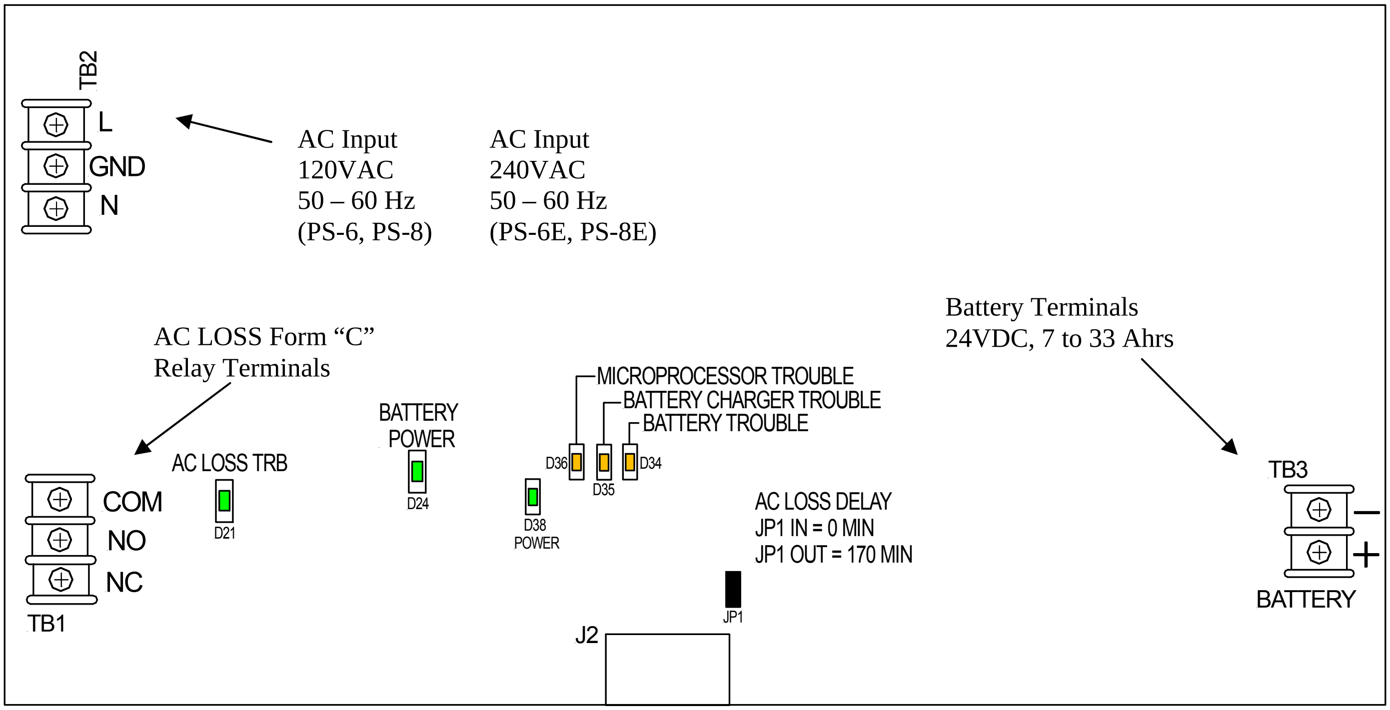


Figure 6: Power Supply/Battery Charger PC Board

Table 1: Power Supply/Battery Charger PC Board Terminal Identification		
Terminal Block Identification Numbers (Figure 1)	***Terminal Identification***	***Function/Description***
TB1 - 1,2,3	AC Trouble	Form "C" contacts rated 24VDC at 1 Amp used for external trouble alerts.
TB2 - 1,2,3	AC Input	Input power terminals for 120VAC, 50 to 60 Hz. Non-Power Limited (PS-6, PS-8)
TB2 - 1,2,3	AC Input	Input power terminals for 240VAC, 50 to 60 Hz. Non-Power Limited (PS-6E, PS-8E)
TB3 - 1,2	Battery	Backup battery terminals: 24VDC, 7 to 33 Ahrs, Sealed Lead Acid Non-Power Limited. **PS-8** – Two 12VDC 12 Ahrs batteries fit inside the enclosure. Batteries larger than 12 Ahrs require an external enclosure such as the Wheelock Product BATC. **PS-6** – Two 12VDC 7 Ahrs batteries fit inside the enclosure. Batteries larger than 7 Ahrs require an external enclosure such as the Wheelock Product BATC.
JP1 - 1,2	JP1	Jumper Sets Delay for Remote AC LOSS Annunciation. JP1 IN = 0 Min Delay JP1 OUT = 170 Min Delay

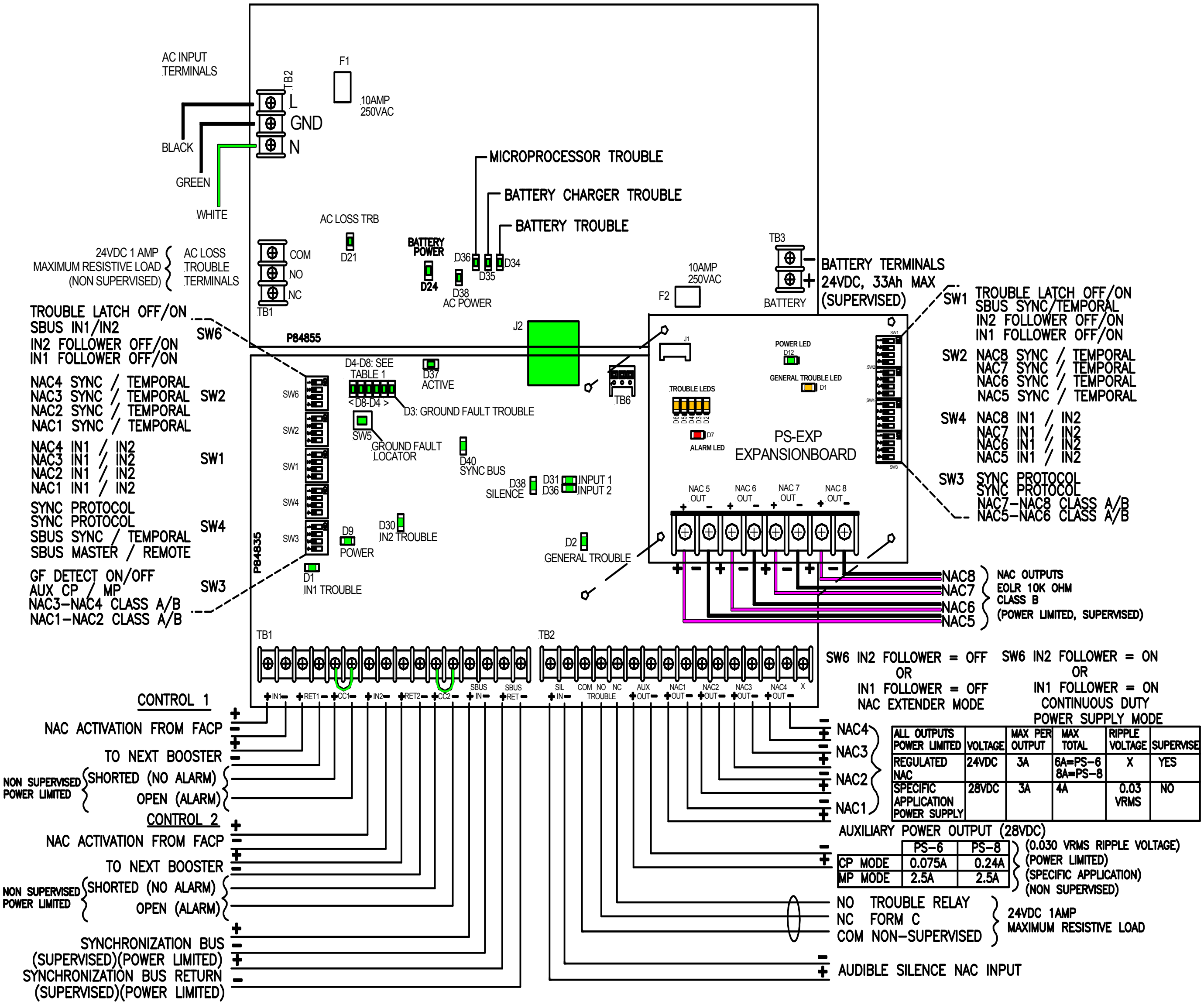


Figure 7: NAC Extender Wiring

Control PC Board

Refer to Figure 4 for the locations of the terminal described in Table 3.

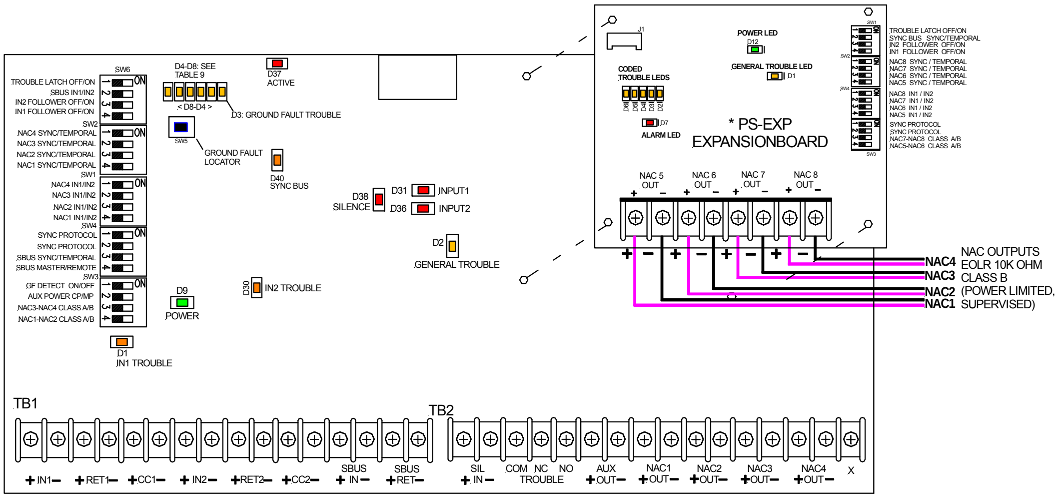


Figure 8: Control PC Board

**** Shown with optional PS-EXP Add on PC Board***

Table 2: Control PC Board Terminal Identification

Terminal Block Identification Numbers	***Terminal Identification***	***Function/Description***
TB1-1, 2	IN1+, IN1-	These terminals connect to the input voltage source (i.e. 12VDC or 24VDC FACP). The FACP will supply a voltage from 8-33VDC at 5mA. During the alarm condition these inputs will cause the designated outputs to drive the notification appliances (designated outputs are set by output DIP switch banks). During Stand-by on a FACP, a trouble condition on the designated loop will cause these inputs to open, providing a trouble condition on the FACP. Alarm condition always overrides trouble to drive output indicating appliances.
TB1-3, 4,	RET1+, RET1-	EOLR is connected on these terminals corresponding to IN1+ and IN1-, or the loop may be continued to other power supplies or appliances before terminating.
TB1-5, 6	CC1+, CC1-	Dry contacts are used to actuate the designated outputs. Contacts are normally closed and actuate the power supply on contact OPEN. Designated outputs correspond to IN1+, IN1-. **NOTE**: FACP NAC circuit cannot energize the power supply by these contacts. When these terminals are not in use, a jumper must be connected across them.
TB1-7, 8	IN2+, IN2-	Same as IN1+, IN1- for corresponding terminals.
TB1-9, 10	RET2+, RET2-	Same as RET1+, RET1- for corresponding terminals.
TB1-11, 12	CC2+, CC2-	Operates the same as C “Dry2” NC for corresponding terminals. When these terminals are not in use, a jumper must be connected across them.
TB1-13, 14	S BUS IN+, IN-	Synchronizing Bus IN: Links from previous PS-8 (PS-6) “S BUS RET” to synchronize both together. Controlled as Master or Remote by switch SW3 Position 4. Current Draw is 0.006 Amps per PS-8 (PS-6).
TB1-15, 16	S BUS RET+, RET-	Synchronizing Bus RET: Sync control output from the master PS-8 (PS-6) to additional PS-8 (PS-6) panel “S BUS IN” terminals. Always place 10K Ohm EOLR on the last panel. Controlled as Master or Remote by switch SW3 Position 4. Up to 40 power supplies can be connected to the PS-8 or 12 to the PS-6.
TB2-1,2	SIL+, SIL-	Audible Silence: NAC input to the master PS-8 (PS-6) from FACP. The Audible signal is transmitted to all PS-8 (PS-6) panels within the loop. Power Limited.
TB2-3,4,5	“NO” “C” “NC” (COMMON TROUBLE OUTPUT)	Typically used to trigger remote alerts or other reporting appliances. Form “C” contacts rated 24VDC at 1 Amp. NOTE: These terminals must be monitored by the FACP for Class “A” mode.
TB2-6, 7	+ AUX OUT -	This output has two modes of operation. The CP Mode is capable of 0.02 Amps for 60 hours (PS-8 only) or 0.24 Amps (PS-8)/0.075 Amps (PS-6) for 24 hours on battery back up for desired auxiliary equipment. The MP Mode provides up to 2.5 Amps in non-alarm condition or when the input AC is present. Special Applications, Power Limited.
TB2-8, 9 **TB2-10, 11** **TB2-12, 13** **TB2-14, 15**	+OUT1- +OUT2- +OUT3- +OUT4-	NAC appliances are connected to these outputs. Each output can supply a maximum load of 3.0 Amps, Class "B" or 3.0 Amps Class "A" and can be individually programmed for Wheelock Strobe Sync Mode, Temporal Mode or Input follower Mode. The outputs can be configured as four Class "B" circuits, two Class "A" circuits, or two Class "B" and one Class "A" circuits. Outputs are controlled by a designated input (INPUT 1 or 2) as selected by the DIP switch for that output. Power Limited.
TB2-16		Not Used

NOTE: The maximum number of NAC appliances is dependent upon the field wire gauge used and the total current draw of the Appliances on the NAC circuit.

C. Connect notification appliances to desired outputs OUT1 – OUT4. See Figure 6.

- The **POWER**PATH has in-out wiring terminals that accept two #18 to #12 American Wire Gauge (AWG) wires at each screw terminal. Strip leads 3/8 inch and connect to screw terminals.
- Separate all in-out wire runs on supervised circuits to insure integrity of circuit supervision. The polarity shown in the wiring diagrams and on the circuit boards is for operation of the appliances. The polarity is reversed by the **POWER**PATH during supervision.
- Total load for the PS-8 NAC circuits shall not exceed 8.0 Amps. Total load for the PS-6 NAC circuits shall not exceed 6.0 Amps.
- Total load of any Class "B" output circuit shall not exceed 3.0 Amps.
- Total load of any Class "A" output circuit shall not exceed 3.0 Amps.

D. Terminate unused Class "B" outputs and the last appliance on an output with a 10K Ohm EOLR. ***Do not terminate*** Class "A" outputs with an EOLR, use jumper wires, see Chapter 6.0 on sheet 22 for example drawings.

E. Connect the indicating circuit(s) from the FACP to the desired input(s), IN1 and IN2. Connect FACP compatible EOLR's to RET1 and RET2.

F. In order to use the audible silence feature, connect a 24V or NAC output to the PS-8 (PS-6) SIL input terminal.

G. If all NAC appliances must activate at the same time, connect "OUT4" from the first PS-8 (PS-6) to the "IN1" of the second PS-8 (PS-6). Next connect the "IN1 RET" of the second PS-8 (PS-6) to the next PS-8 (PS-6) "IN1. Connect a 10K EOLR to the "IN1 RET" terminal on the last PS-8 (PS-6).

If NAC appliances must be activated sequentially (not all at the same time) connect the SYNC BUS/SYNC BUS RET between PS-8 (PS-6).

H. Connect desired auxiliary equipment to the auxiliary output terminals +AUX-. See Sheet 33, Section 8.0, for the List of Compatible AUX Devices.

- Total load of the AUX output shall not exceed 0.02 Amps during 60 hour battery backup in the Constant Power (CP) mode, if using standard 12 Ahr batteries.
- Total load of the AUX output shall not exceed 0.24 Amps during 24 hour battery backup in the Constant Power (CP) mode, if using standard 12 Ahr batteries.
- Total load of the AUX output shall not exceed 0.075 Amps during 24 hour battery backup in the Constant Power (CP) mode for the PS-6, if using standard 7 Ahr batteries.
- Total load of the AUX output shall not exceed 2.5 Amps in the Managed Power (MP) mode.

I. Connect system trouble relay terminals as desired.

3.0 SETTING THE DIP SWITCHES

3.1 CONTROL PC BOARD

Refer to Figure 9 for the location and setting of the DIP switches on the Control PC board.

1. Set NAC output DIP Switch(s) on SW1 to follow corresponding input (IN1, IN2).
2. See Figure 8 for DIP switch locations and Table 3 for DIP Switch Selection and DIP Switch Settings

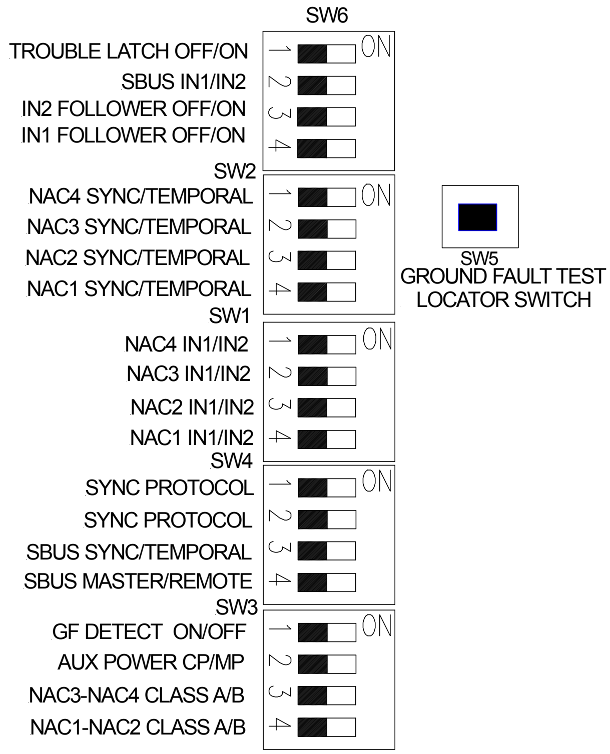


Figure 9: Control PC Board DIP Switches

Table 3: Control PC Board DIP Switch Settings

DIP Switch	Function Description	Dip Switch Setting: "LEFT"	Dip Switch Setting: "RIGHT"	Dip Switch Setting: "LEFT"	Dip Switch Setting: "RIGHT"
SW6					
Position 1	TROUBLE LATCH OFF / ON	Any trouble conditions will clear automatically as the trouble condition is repaired.	Trouble indicators latch ON until this switch is switched to the disable (LEFT) position or all power is removed from the panel.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 2	SBUS IN1 / IN2	If IN1 Follower = ON, SBUS will repeat the signals on IN1 / CC1 input.	If IN2 Follower = ON, SBUS will repeat the signals on IN2 / CC2 input.	If IN1 Follower = ON, NAC Output(s) set to trigger on IN1 / CC1 will repeat the signals on the SBUS when IN1 / CC1 "Activates."	If IN1 Follower = ON, NAC Output(s) set to trigger on IN1 / CC1 will repeat the signals on IN1 / CC1 input, ignoring the NAC Output's SYNC / TEMPORAL dipswitch settings.
		If IN1 Follower = OFF, SBUS will generate signals according to its SW2 - SYNC / TEMPORAL switch setting.	If IN2 Follower = OFF, SBUS will generate signals according to its SW2 - SYNC / TEMPORAL switch setting.	If IN1 Follower = OFF, NAC Output(s) set to trigger on IN1 / CC1 will repeat the signals on the SBUS when IN1 / CC1 "Activates."	If IN1 Follower = OFF, NAC Output(s) set to trigger on IN1 / CC1 will repeat the signals on the SBUS when IN1 / CC1 "Activates."
Position 3	IN2 FOLLOWER OFF / ON	NAC Output(s) or SBUS set to trigger on IN2 / CC2 will generate signals according to its SYNC / TEMPORAL switch setting.	NAC Output(s) or SBUS set to trigger on IN2 / CC2 turn on when IN2 / CC2 is "Active" and will apply NAC reverse supervision voltage when IN2 / CC2 is "Not Active."	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.

Position 4	IN1 FOLLOWER OFF / ON	NAC Output(s) or SBUS set to trigger on IN1 / CC1 will generate signals according to its SYNC / TEMPORAL switch setting.	NAC Output(s) or SBUS set to trigger on IN1 / CC1 turn on when IN1 / CC1 is "Active" and will apply NAC reverse supervision voltage when IN1 / CC1 is "Not Active."	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.
SW2					
Position 1	NAC4 SYNC / TEMPORAL	Sets Sync pattern on NAC4	Sets CODE 3 Temporal Pattern on NAC4.	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.
Position 2	NAC3 SYNC / TEMPORAL	Sets Sync pattern on NAC3	Sets CODE 3 Temporal Pattern on NAC3.	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.
Position 3	NAC2 SYNC / TEMPORAL	Sets Sync pattern on NAC2	Sets CODE 3 Temporal Pattern on NAC2.	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.
Position 4	NAC1 SYNC / TEMPORAL	Sets Sync pattern on NAC1	Sets CODE 3 Temporal Pattern on NAC1.	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.
SW1					
Position 1	NAC4 IN1 / IN2	Input 1 (IN1or CC1) triggers NAC4. Any trouble condition on NAC4 will cause an open condition on IN1_RET & IN2_RET.	Input 2 (IN2 or CC2) triggers NAC4. Any trouble condition on NAC4 will cause an open condition on IN1_RET & IN2_RET.	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.
Position 2	NAC3 IN1 / IN2	Input 1 (IN1or CC1) triggers NAC3. Any trouble condition on NAC3 will cause an open condition on IN1_RET & IN2_RET.	Input 2 (IN2 or CC2) triggers NAC3. Any trouble condition on NAC3 will cause an open condition on IN2_RET.	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.
Position 3	NAC2 IN1 / IN2	Input 1 (IN1or CC1) triggers NAC2. Any trouble condition on NAC1 will cause an open condition on IN1_RET.	Input 2 (IN2 or CC2) triggers NAC2. Any trouble condition on NAC2 will cause an open condition on IN1_RET & IN2_RET.	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.
Position 4	NAC1 IN1 / IN2	Input 1 (IN1or CC1) triggers NAC1. Any trouble condition on NAC1 will cause an open condition on IN1_RET & IN2_RET.	Input 2 (IN2 or CC2) triggers NAC1. Any trouble condition on NAC1 will cause an open condition on IN1_RET & IN2_RET.	See SW6 Position 2's description for this setting.	See SW6 Position 2's description for this setting.
SW4					
Position 1	SYNC PROTOCOL	Wheelock Sync Only – Leave in this position.	For Future Use	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 2	SYNC PROTOCOL	Wheelock Sync Only – Leave in this position.	For Future Use	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 3	SBUS SYNC / TEMPORAL	SBUS Output Terminals will self generate SYNC.	SBUS Output Terminals will self generate TEMPORAL.	In REMOTE Mode Set this switch to same setting as MASTER PS-8 (PS-6).	In REMOTE Mode Set this switch to same setting as MASTER PS-8 (PS-6).
Position 4	SBUS MASTER / REMOTE	Sets the NAC Extender to "MASTER MODE"	Sets the NAC Extender to "REMOTE MODE"	Sets the NAC Extender to "MASTER MODE"	Sets the NAC Extender to "REMOTE MODE"
SW3					
Position 1	GF DETECT ON / OFF	Ground Fault Detect – ON	Ground Fault Detect – OFF Clear Ground Fault test results. NOTE: LEAVING THE SWITCH IN THIS POSITION IS NOT COMPATIBLE WITH UL-864	Same Functionality as Master Mode.	Same Functionality as Master Mode. NOTE: LEAVING THE SWITCH IN THIS POSITION IS NOT COMPATIBLE WITH UL-864
Position 2	AUX POWER CP / MP	Constant Power (CP) – Provides Auxiliary power in alarm and on battery backup.	Managed Power (MP) – Power is off in alarm and when there is a loss of AC.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 3	NAC3-NAC4 CLASS A / B	Set NAC3-NAC4 for CLASS A Mode.	Set NAC3-NAC4 CLASS B for CLASS B Mode.	Same Functionality as Master Mode.	Same Functionality as Master Mode.
Position 4	NAC1-NAC2 CLASS A / B	Set NAC1-NAC2 for CLASS A Mode.	Set NAC1-NAC2 CLASS B for CLASS B Mode.	Same Functionality as Master Mode.	Same Functionality as Master Mode.

EXAMPLE – Basic Settings on the Control PC Board For a 4 NAC, Class B circuit output controlled by Input 1 (IN1), Wheelock Sync, Auxiliary power in the Constant Power mode(CP), and Ground Fault detection, set the switches as follows:

SW2 Positions 1 - 4	Left
SW1 Positions 1 - 4	Left
SW3 Positions 1 - 2 Positions 3 - 4	Left Right
SW4 Positions 1 - 4	Left
SW6 Positions 1 - 4	Left

4.0 Applying Power to the Power Supply Panel

Now that all the Wiring is complete and the switch settings have been made, it's time to apply power to the Power Supply panel.

WARNING **ALWAYS APPLY AC POWER BEFORE APPLYING BATTERY POWER. ALWAYS REMOVE BATTERY POWER BEFORE REMOVING AC POWER. FAILURE TO DO SO CAN CAUSE DAMAGE TO THE POWER SUPPLY COMPONENTS.**

1. Connect AC source. The AC source shall be connected to a dedicated, non-switch power source. The AC must first be wired into the buildings main electrical power. The conduit entry can be either from the top or left side using the knock-outs. See Figure 8. Connect Earth Ground First.

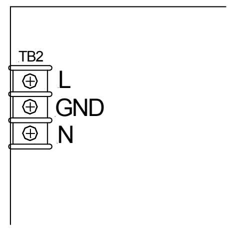


Figure 10:
AC Power Terminals on the Power Supply PC Board

2. Connect backup batteries. Batteries shall be Sealed Lead Acid type. Observe correct polarity and voltage. Use two of the same size batteries connected in series as shown in Figure 9. Use up to 33 Ahr batteries depending on circuit loading, BATTERY CALCULATION SHEET is provided on pages 20 and 21.

NOTE: The PS-8 enclosure can accommodate two 12VDC batteries up to 12 Ahr in size. Batteries larger than 12 Ahr must be stored in a separate battery enclosure such as the Wheelock BATC Battery Enclosure.

The PS-6 enclosure can accommodate two 12VDC batteries up to 7 Ahr in size. Batteries larger than 7 Ahr must be stored in a separate battery enclosure such as the Wheelock BATC Battery Enclosure.

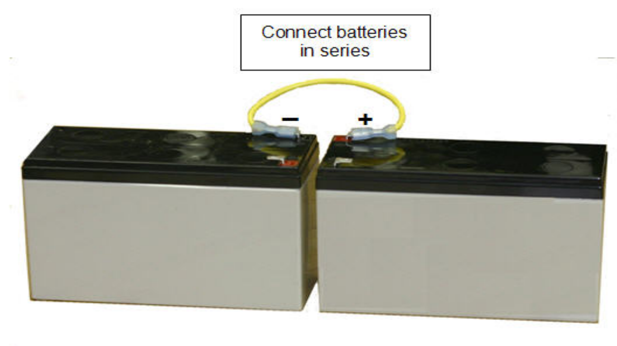


Figure 11: Batteries Connected in Series

WARNING **TWO DIFFERENT SOURCES OF POWER MAY BE CONNECTED TO THIS PANEL. DISCONNECT BOTH SOURCES OF POWER BEFORE SERVICING. FAILURE TO DISCONNECT BOTH SOURCES OF POWER BEFORE SERVICING COULD RESULT IN PROPERTY DAMAGE, SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

BATTERY MAINTENANCE

Battery Replacement: Replace with new batteries every four (4) years or as needed if battery will no longer accept full charge. Two 12V batteries are required for 24VDC.

The Power supply is now operational. Table 4 is a list of the LED indicators on the Power Supply/Battery Charger PC board. Table 4 is a list of the LED indicators on the Control PC board. Amber LED indicators always indicate a trouble condition. If amber LED indicator(s) light turn to the troubleshooting section for resolution.

5.0 TROUBLESHOOTING:

WARNING

THE PS-8 POWERPATH **CONTAINS VOLTAGES THAT CAN CAUSE DEATH OR SERIOUS INJURY. ALWAYS OBSERVE PROPER ELECTRICAL SAFETY PRECAUTIONS AND WARNINGS.**

Always follow good troubleshooting procedures:

- When trouble occurs, observe all visual indications and note them Refer to the interior door label.

- If the problem is obvious or it can be located on the Troubleshooting Table, note it. Refer to the interior door label.

- Always de-energize the **POWER**PATH completely (Remove both AC and DC power) before repairs.

- While the **POWER**PATH is de-energized, perform a visual and hands on check of all terminals and wires to ensure proper termination.

- If intermittent troubles occur, use the trouble latch (SW2 Position 4) to find it.

Troubleshooting Using the LED Indicators

Power Supply/Battery Charger PC Board.

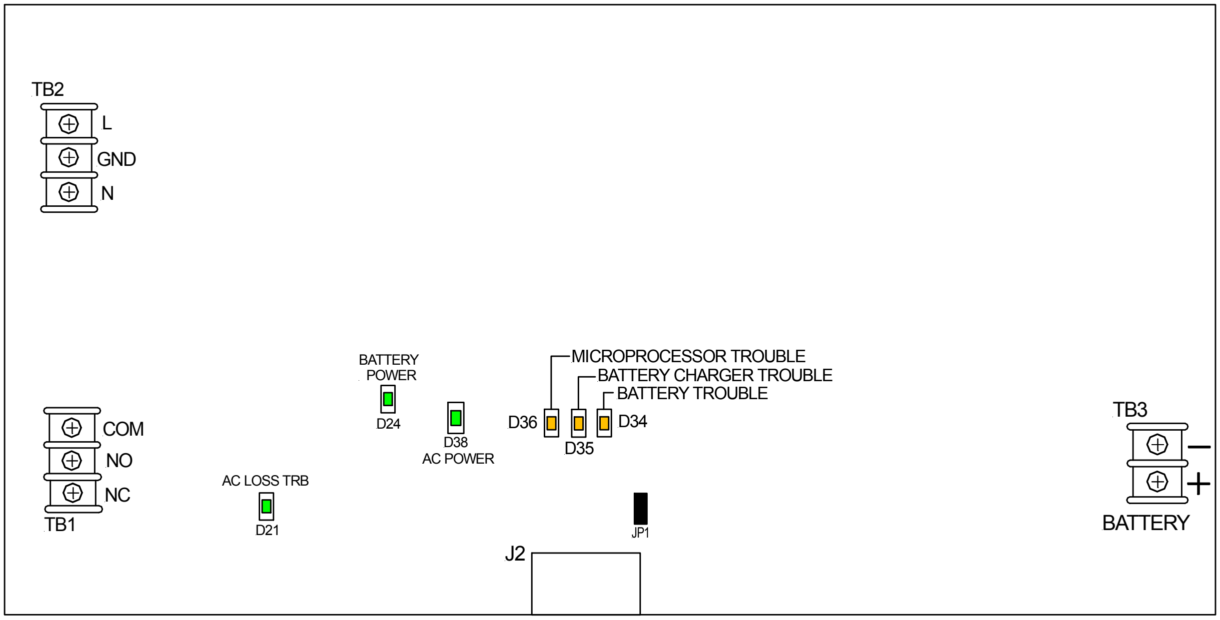


Figure 12: Power Supply/Battery Charger PC Board Trouble LED Locations

Table 4: Power Supply/Battery Charger PC Board LED Trouble Indicators

LED Designator	***Identification***	***LED Color***	***Description***	***Action***
D38	AC Power	Green	Indicates when AC power is applied to the PC board.	No Action Required
D24	Battery Power	Green	Indicates when battery power is applied to the PC board.	No Action Required
D34	Battery Trouble	Amber	Indicates that a trouble condition exists on the battery circuit.	Check the battery wiring and terminal connections. Replace the batteries.
D35	Battery Charger Trouble	Amber	Indicates that the battery charger section is not working.	Remove the batteries from the terminals. Using a DC voltmeter check the voltage across the terminals. The voltage should be 26.5VDC or higher. If the voltage is not present, the battery charger section has failed. Replace the PC Board. If the voltage is present, replace the batteries.
D36	Processor Trouble	Amber	Indicates that a trouble condition exists on the processor circuit.	Disconnect DC and AC voltages from the power supply PC board. Wait 10 seconds and reconnect. If the problem does not clear, replace the PC board.
D21	AC Loss	Amber	Indicates a brown out or total loss of AC power.	Check AC Mains is properly connected. Check branch circuit breaker powering the PS6/8. Check the AC Mains Fuse, F1.

NOTE: Power Supply PCB trouble conditions will change the state of the Logic PCB General Trouble Relay after 33 seconds.

Control PC Board

Coded Trouble LEDs
D8, D7, D6, D5, D4

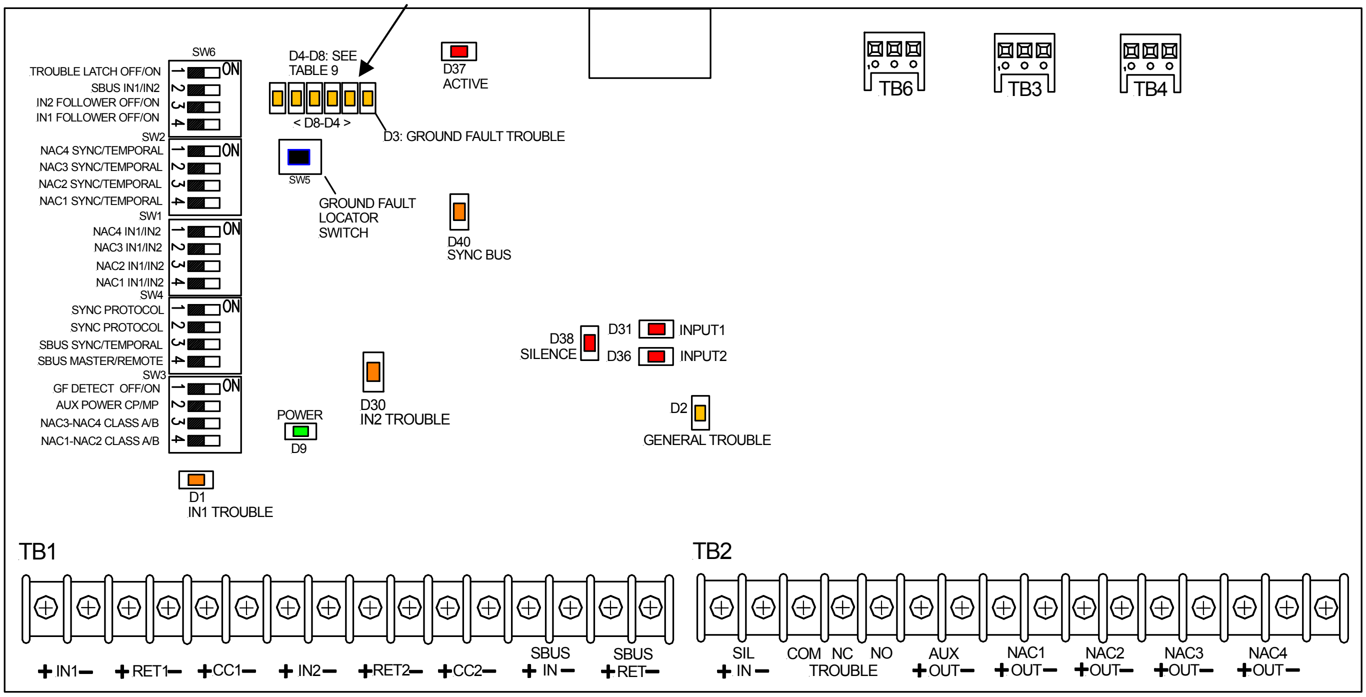


Figure 13: Control PC Board Trouble LED Locations

Table 5: Control PC Board LED Trouble Indicators				
LED Designator	***Identification***	***LED Color***	***Description***	***Action***
D9	Power	Green	Indicates when power is applied to the Control board.	No Action Required
D37	Active	Red	Indicates when the power supply is activated and supplying power to the NAC output circuits.	No Action Required
D2	System Trouble	Amber	Indicates that a general trouble condition exists on the Control board.	Check the Coded Trouble LED Indicators and the Ground Fault LED. Repair any problems indicated. If no indication is observed, replace the Control PC Board. See Table 7
D8, D7, D6, D5, D4	Coded Trouble LED Indicators	Amber	These five LEDs light in a coded pattern indicating the location and type of trouble condition. If multiple troubles are present the LEDs will indicate the highest priority trouble. When repaired the LEDs will indicate the next priority trouble.	See Table 7
D3	General Ground Fault	Amber	Indicates that a ground fault condition exists. Pressing switch SW5 will cause the code pattern on the coded Trouble LEDs to locate the location.	See Table 7
D1, D30	IN1 RET, IN2 RET Trouble	Amber	Indicates that a general trouble condition exists, and the IN1 RET and IN2 RET relays are open.	See Table 7
D40	SYNC BUS Power Active	Green	This LED lights when 24V is present on the SYNC BUS.	See Table 7
D31	IN1/CC1 Active	Red	This LED lights when IN1 or CC1 has been activated.	See Table 7
D36	IN2/CC2 Active	Red	This LED lights when IN2 or CC2 has been activated.	See Table 7
D38	Silence Active	Red	This LED turns on when the “SILENCE” feature has been activated.	See Table 7

Trouble Condition Priority Identification

When multiple troubles exist the Control PC board Coded Trouble LED Indicators indicate the highest priority trouble. Table 6 shows the priority sequence. When the highest priority is repaired, the next highest priority will automatically be displayed. Table 6 lists the coded condition of these 5 LED indicators and the action required.

Table 6: Control PC Board Trouble Priority Identification	
Location Priority	***Location Displayed Priority***
1. NAC 1 2. NAC 2 3. NAC 3 4. NAC 4 5. AUX 6. CC1 7. CC2 8. SYNC BUS	1. CURRENT LIMIT 2. SHORT 3. OPEN 4. GROUND FAULT

Table 7: Control PC Board Coded Trouble Identification

Coded Trouble LED's "□" = OFF, "■" = ON						***Trouble Locator***	***Trouble Condition***	***Action***
D8	**D7**	**D6**	**D5**	**D4**	**D3**			
□	□	□	□	□	□	No Fault	No Fault	No Action Required.
□	□	□	□	□	■	Ground Fault	Ground Fault	Shut off AC Mains Power to unit. Open cabinet door. Press and hold SW5, Ground Fault Locator Switch for 5 seconds. Release switch.
□	□	□	□	■	□	NAC Output 1	Short	Check for a wiring short. Check for a shorted or improperly wired NAC Appliance. (If an appliance is wired + to – and – to + a short trouble will be indicated.
□	□	□	■	□	□	NAC Output 1	Open	Check OUT1 terminals for good connections. Check NAC circuit wiring for continuity. Check NAC circuit for 10K Ohm EOLR.
□	□	□	■	■	□	NAC Output 1	Current Limit	Reduce the number of NAC Appliances on Output1.
□	□	■	□	□	□	NAC Output 2	Short	Check for a wiring short. Check for a shorted or improperly wired NAC Appliance. (If an appliance is wired + to – and – to + a short trouble will be indicated.
□	□	■	□	■	□	NAC Output 2	Open	Check OUT2 terminals for good connections. Check NAC circuit wiring for continuity. Check NAC circuit for 10K Ohm EOLR.
□	□	■	■	□	□	NAC Output 2	Current Limit	Reduce the number of NAC Appliances on Output1.
□	□	■	■	■	□	NAC Output 3	Short	Check for a wiring short. Check for a shorted or improperly wired NAC Appliance. (If an appliance is wired + to – and – to + a short trouble will be indicated.
□	■	□	□	□	□	NAC Output 3	Open	Check OUT3 terminals for good connections. Check NAC circuit wiring for continuity. Check NAC circuit for 10K Ohm EOLR.
□	■	□	□	■	□	NAC Output 3	Current Limit	Reduce the number of NAC Appliances on Output1.
□	■	□	■	□	□	NAC Output 4	Short	Check for a wiring short. Check for a shorted or improperly wired NAC Appliance. (If an appliance is wired + to – and – to + a short trouble will be indicated.
□	■	□	■	■	□	NAC Output 4	Open	Check OUT4terminals for good connections. Check NAC circuit wiring for continuity. Check NAC circuit for 10K Ohm EOLR.
□	■	■	□	□	□	NAC Output 4	Current Limit	Reduce the number of NAC Appliances on Output1.

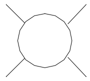
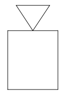
□	■	■	□	■	□	AUX Output	Current Limit	Reduce the number of NAC Appliances on Output1
□	■	■	■	□	□	SYNC BUS	Short	Check for a wiring short. Check for improperly wired NAC circuit. (If an appliance is wired + to – and – to + a short trouble will be indicated.
□	■	■	■	■	□	SYNC BUS	Open	Check SYNC BUS terminals for good connections. Check NAC circuit wiring for continuity. Check NAC circuit for 10K Ohm EOLR.
■	□	□	□	□	■	SYNC BUS	Current Limit	Excessive current on the SYNC BUS. Reduce the number of Power Supplies connected to the circuit.
■	□	□	□	■	■	Dry Contact 1	Ground Fault (Note 1)	Check for circuit wire to enclosure or conduit.
■	□	□	■	□	■	Dry Contact 2	Ground Fault (Note 1)	Same as above
■	□	□	■	■	■	NAC Output 1+	Ground Fault (Note 1)	Same as above
■	□	■	□	□	■	NAC Output 1–	Ground Fault (Note 1)	Same as above
■	□	■	□	■	■	NAC Output 2+	Ground Fault (Note 1)	Same as above
■	□	■	■	□	■	NAC Output 2–	Ground Fault (Note 1)	Same as above
■	□	■	■	■	■	NAC Output 3+	Ground Fault (Note 1)	Same as above
■	■	□	□	□	■	NAC Output 3–	Ground Fault (Note 1)	Same as above
■	■	□	□	■	■	NAC Output 4+	Ground Fault (Note 1)	Same as above
■	■	□	■	□	■	NAC Output 4–	Ground Fault (Note 1)	Same as above
■	■	□	■	■	■	AUX Output+	Ground Fault (Note 1)	Same as above
■	■	■	□	□	■	AUX Output–	Ground Fault (Note 1)	Same as above
■	■	■	□	■	■	SYNC BUS+	Ground Fault (Note 1)	Same as above
■	■	■	■	□	■	SYNC BUS-	Ground Fault (Note 1)	Same as above
■	■	■	■	■	■	Battery Wires	Ground Fault (Note 1)	Same as above

Note 1: When LED indicator D3 is lighted, it indicates a general ground fault condition. Momentarily depress switch SW5 (Ground Fault Detect Enable Pushbutton). The Coded Trouble LEDs will indicate the circuit location of the ground fault.

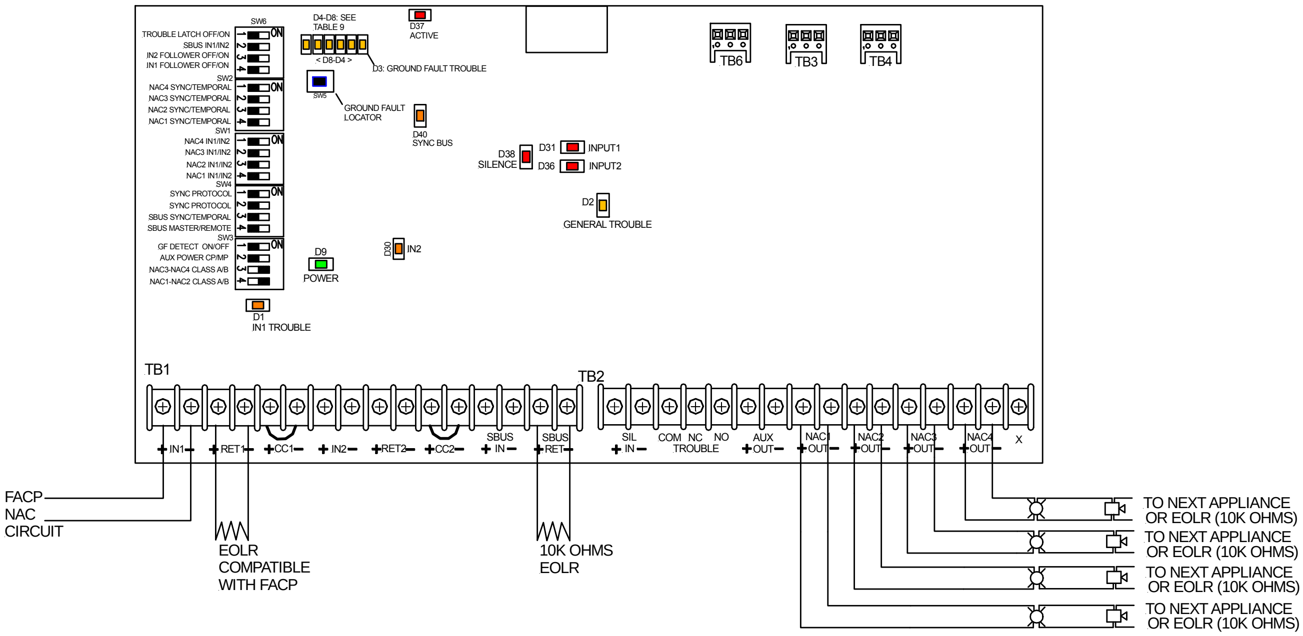
FUSE REPLACEMENT PROCEDURE:

1. Turn off the AC Mains Power.
2. Open the enclosure and turn off DC battery power.
3. Remove F1.
4. Replace F1 with a 10A 250V fuse.
5. Remove F2.
6. Replace F2 with a 10A 250V fuse.
7. Turn on DC battery power.
8. Close the enclosure.
9. Turn on AC Mains.

6.0 OPERATION EXAMPLES

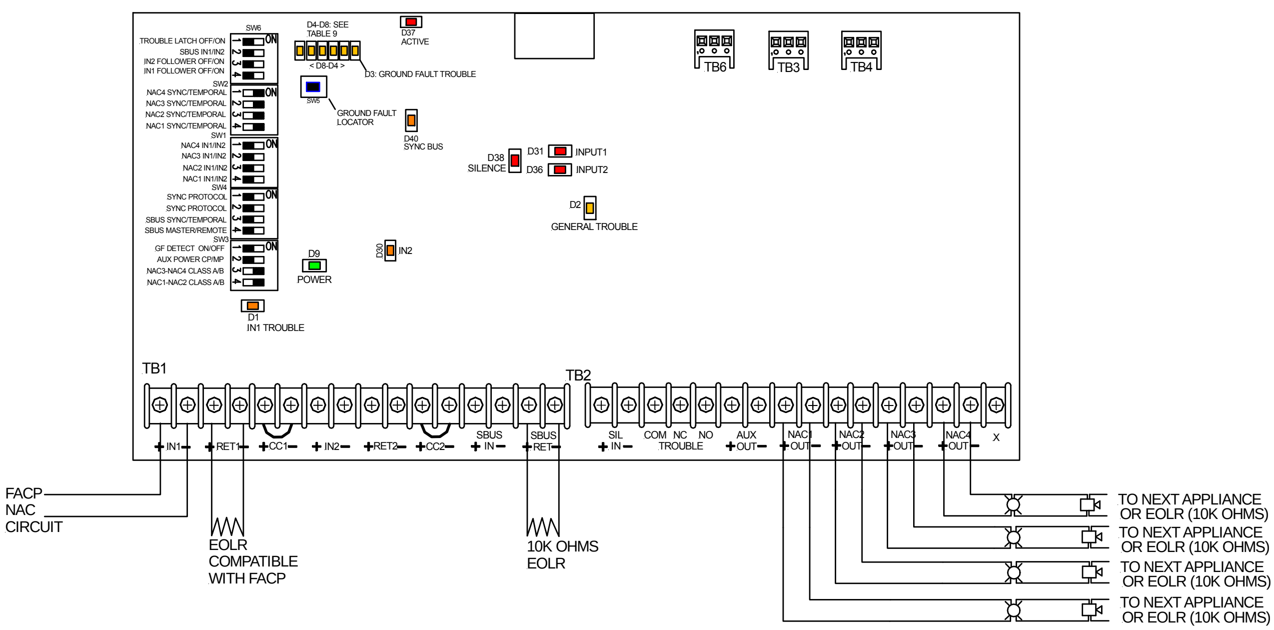
LEGEND:  = STROBE  = AUDIBLE

Example 1: WHEELOCK SYNC MODE without Audible Silence (CLASS B)



- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.
- If only strobes are connected to the **POWER**PATH outputs, the SILENCE input is not required.

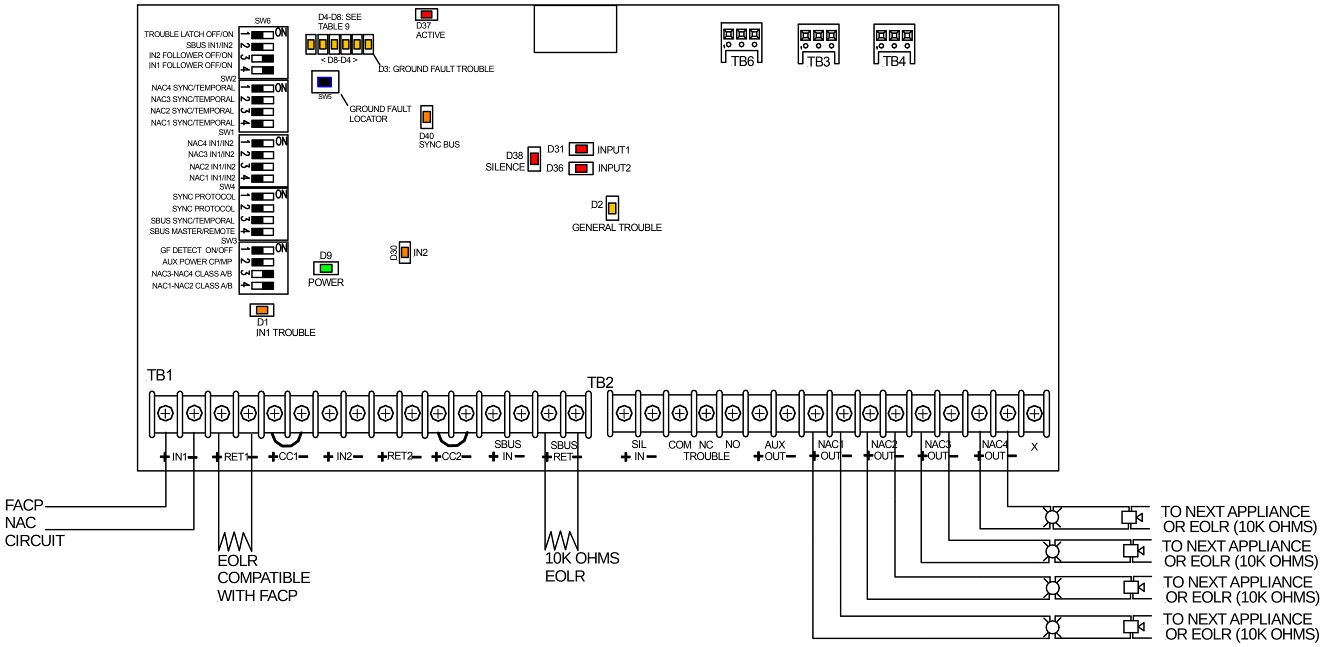
Example 2: TEMPORAL MODE (CLASS B)



⚠ **CAUTION:** Strobes require constant voltage and will not operate properly in the TEMPORAL MODE. A second output set in the NORMAL MODE will provide the constant voltage.

⚠ **CAUTION:** Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

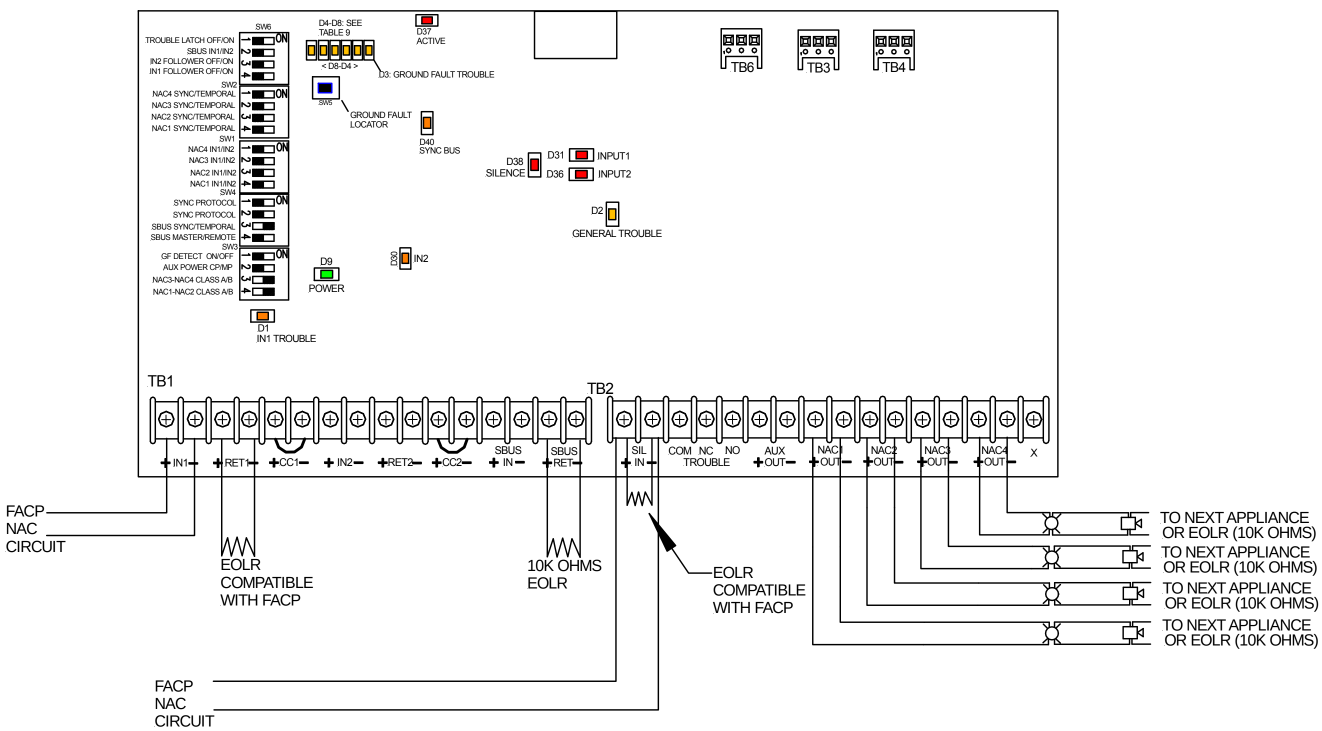
Example 3: IN>OUT SYNC MODE from CODED INPUT SOURCE (CLASS B)



Minimum pulse duration for coded signals must be greater than 0.25 seconds.

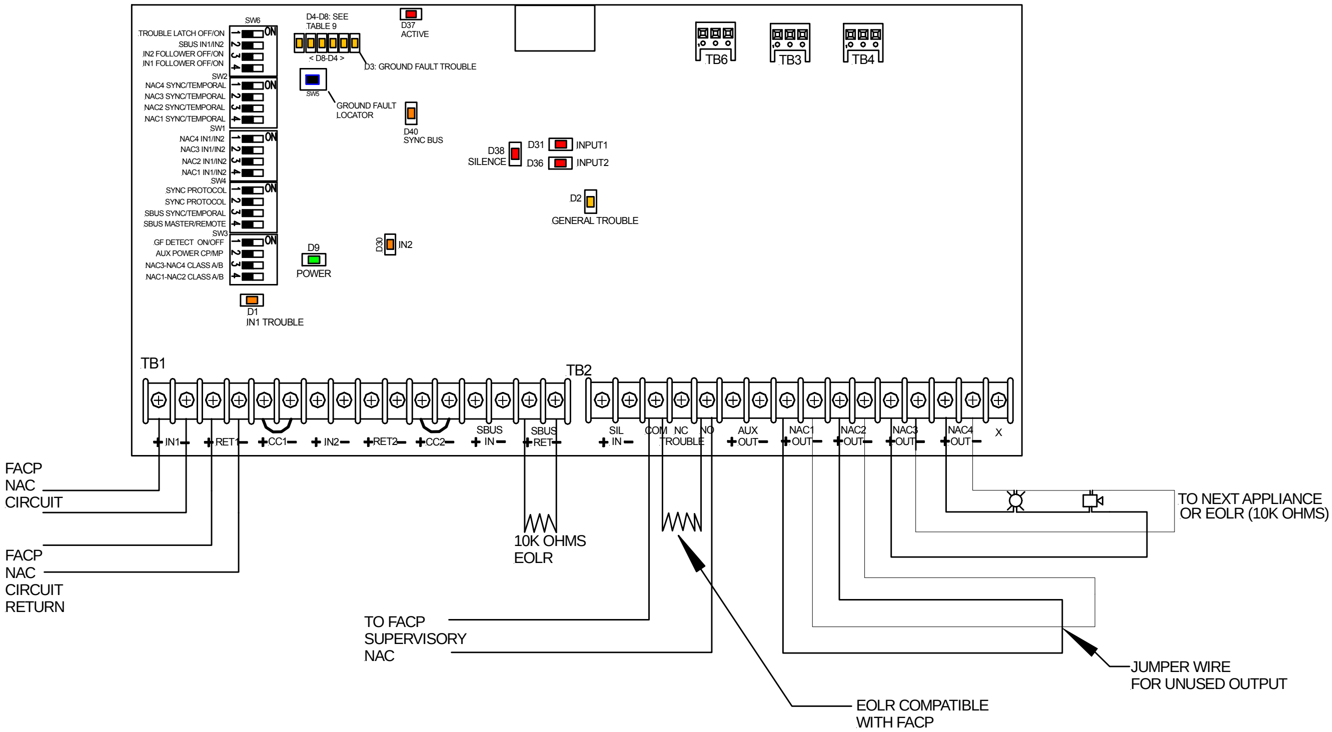
⚠ **CAUTION:** Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

Example 4: WHEELOCK SYNC MODE with Audible Silence (CLASS B)



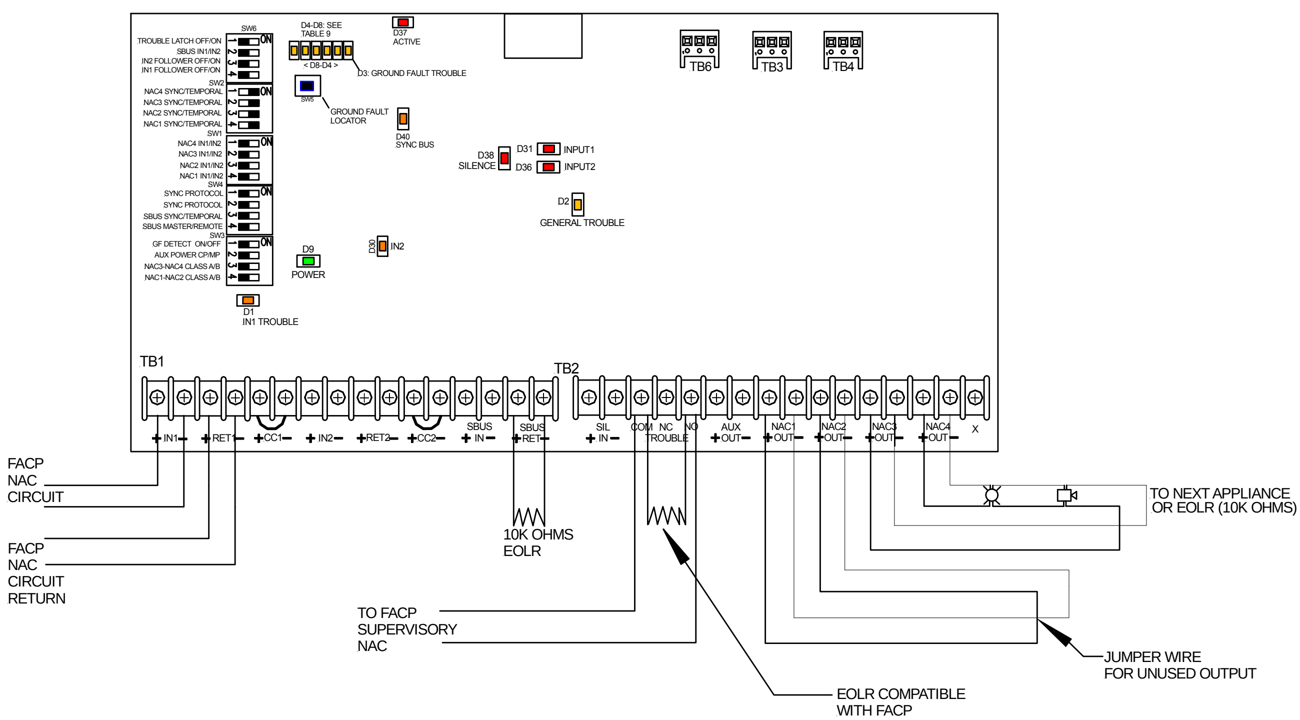
- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.
- When the Silence (SIL) terminals receive a NAC voltage, silence-able horn outputs connected to IN1 and/or IN2 will be silenced.

Example 5: WHEELOCK SYNC MODE without Audible Silence (CLASS A)



Note: To monitor trouble in Class A Mode, only use the "COM", "NC" and "NO" terminals.

Example 6: TEMPORAL MODE (CLASS A)

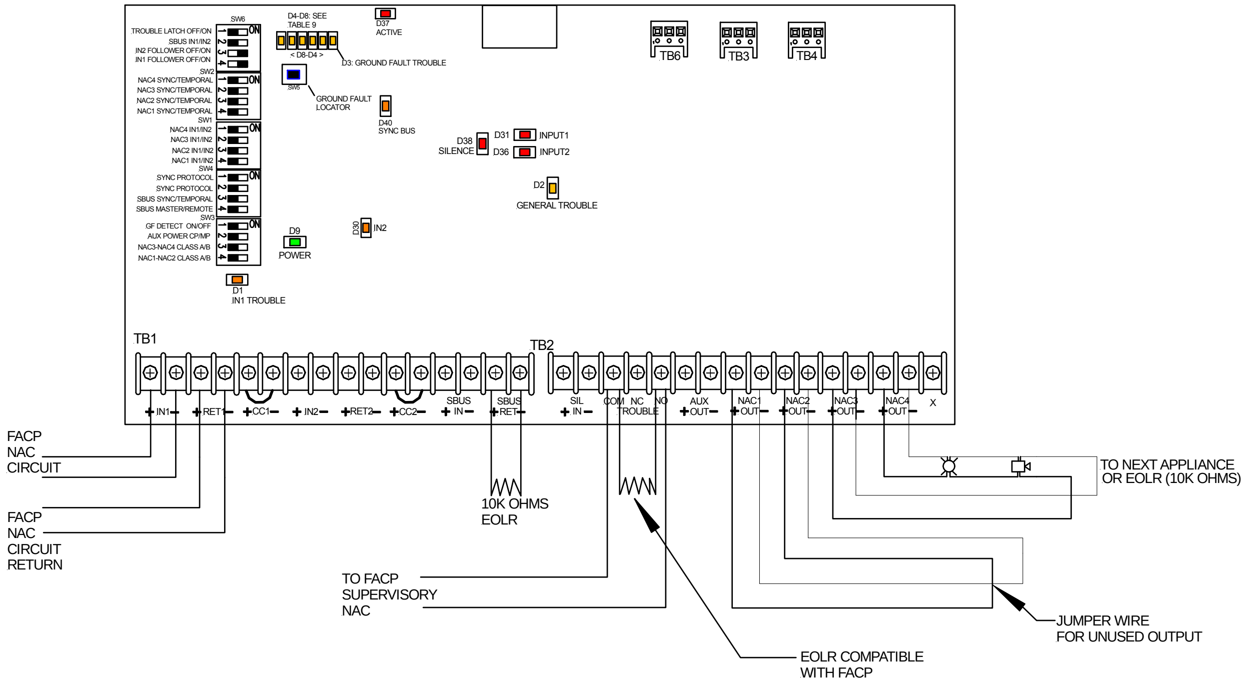


⚠ **CAUTION:** Strobes require constant voltage and will not operate properly in the TEMPORAL MODE. A second output set in the NORMAL MODE will provide the constant voltage.

⚠ **CAUTION:** Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

Note: To monitor trouble in Class A Mode, only use the "COM", "NC" and "NO" terminals.

Example 7: IN>OUT SYNC MODE from CODED INPUT SOURCE (CLASS A)

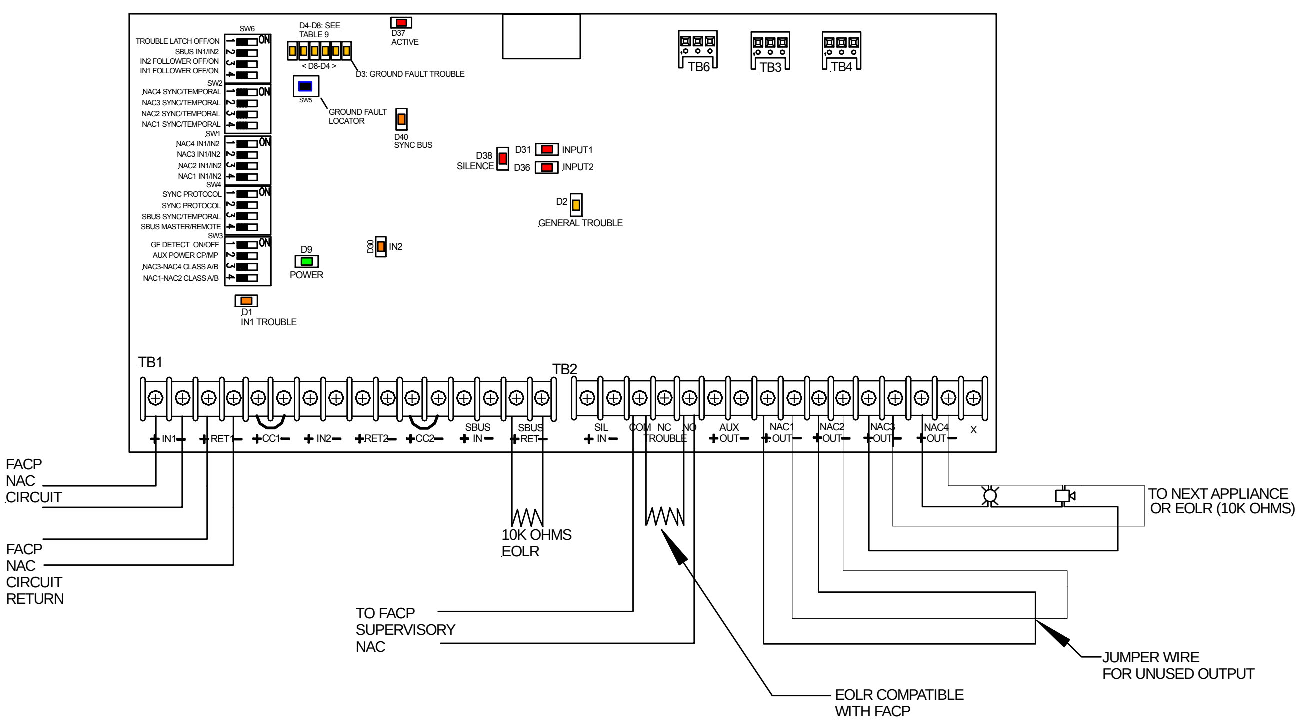


Minimum pulse duration for coded signals must be greater than 0.25 seconds.

⚠ **CAUTION:** Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

Note: To monitor trouble in Class A Mode, only use the “COM”, “NC” and “NO” terminals.

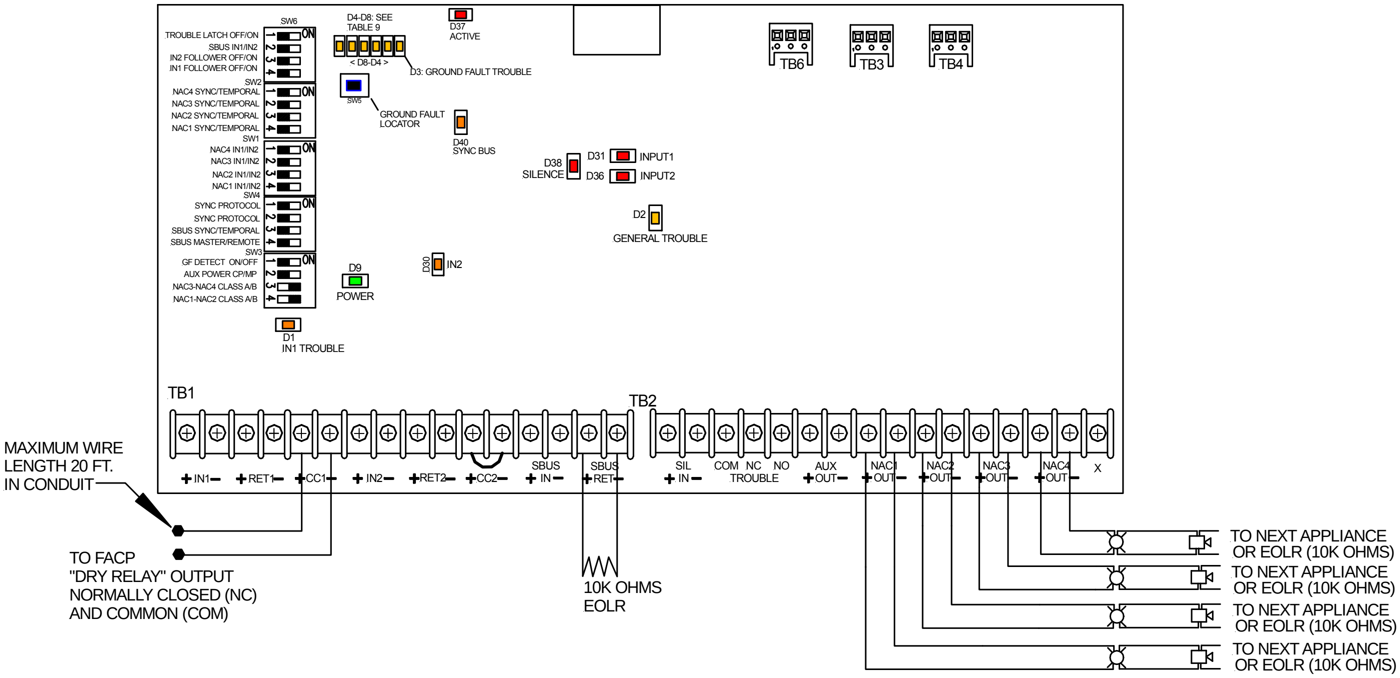
Example 8: WHEELOCK SYNC MODE with Audible Silence (CLASS A)



- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.
- When the Silence (SIL) terminals receive a NAC voltage, silence-able horn outputs connected to IN1 and/or IN2 will be silenced.

Note: To monitor trouble in Class A Mode, only use the “COM”, “NC” and “NO” terminals.

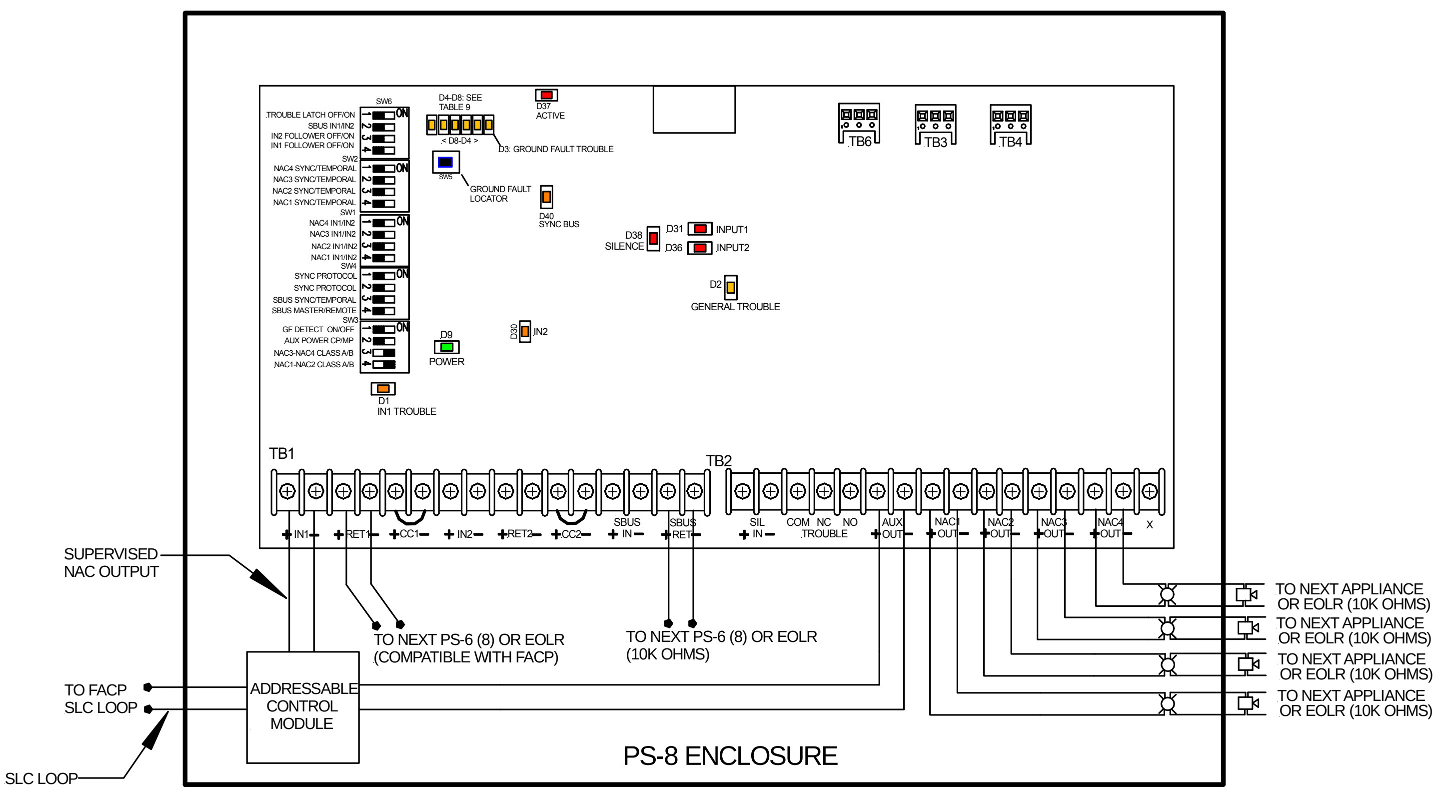
Example 9: ACTIVATING THE PS-6/8 with a "DRY CONTACT" (CLASS B)



Minimum pulse duration for coded signals must be greater than 0.125 seconds.

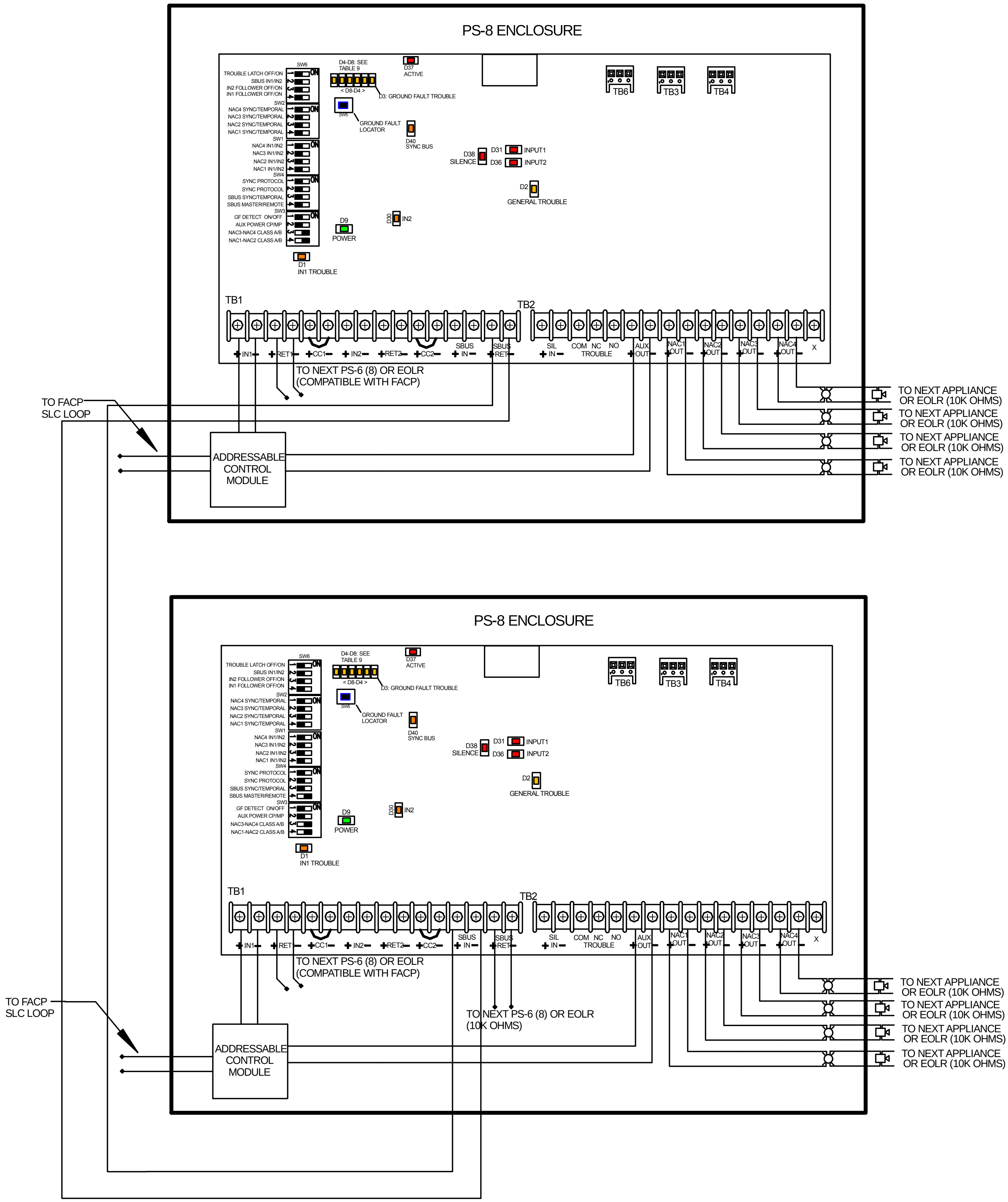
⚠ **CAUTION:** Only use audible appliances that can use a coded signal. Do not use with Wheelock Series AS/AH, NS/NH or HS4/HS appliances.

Example 10: ADDRESSABLE CONTROL MODULE ACTIVATING the PS-6/8 (CLASS B)

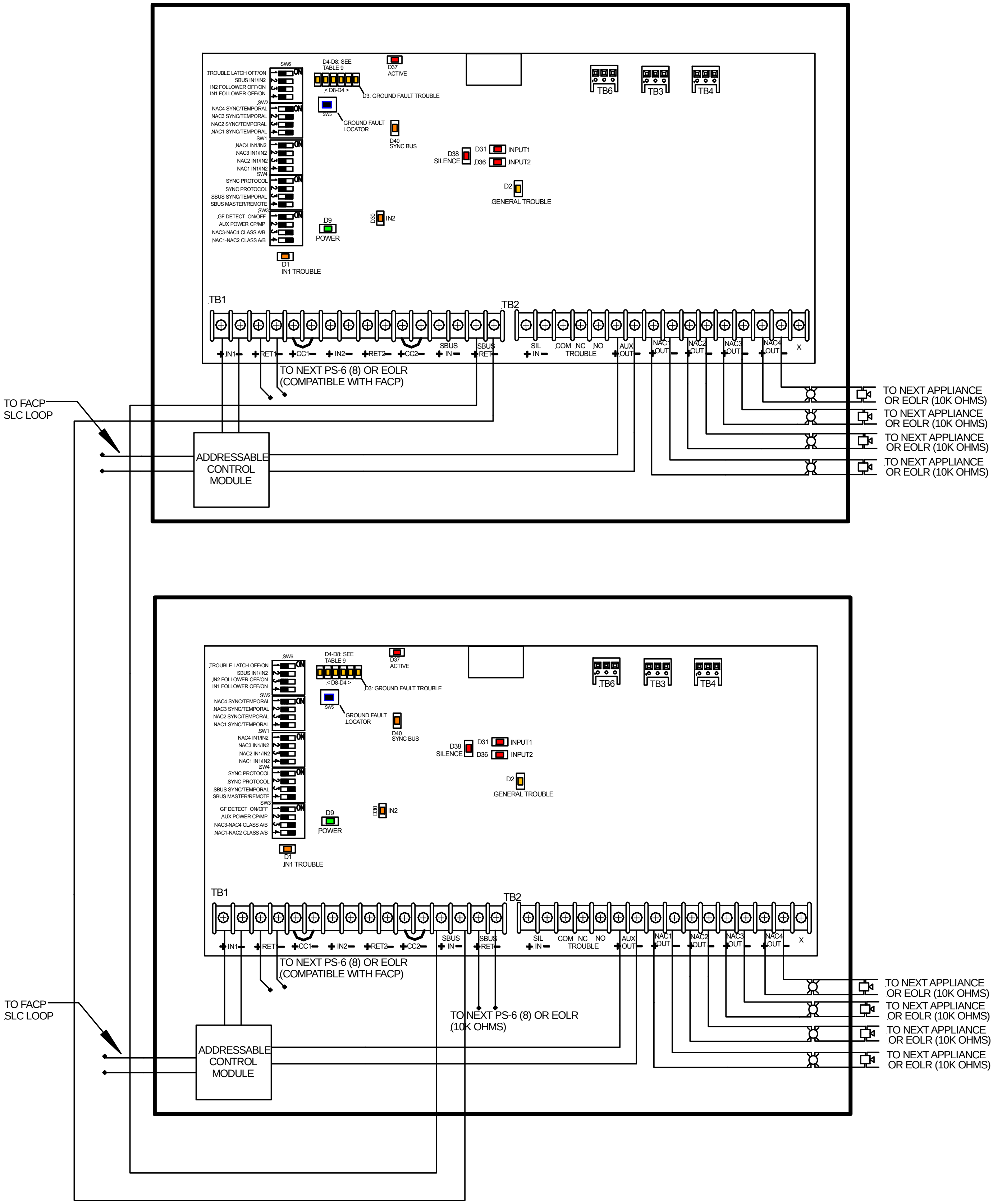


- This mode will only synchronize Wheelock horns, horn strobes, and strobes with the synchronization capability.

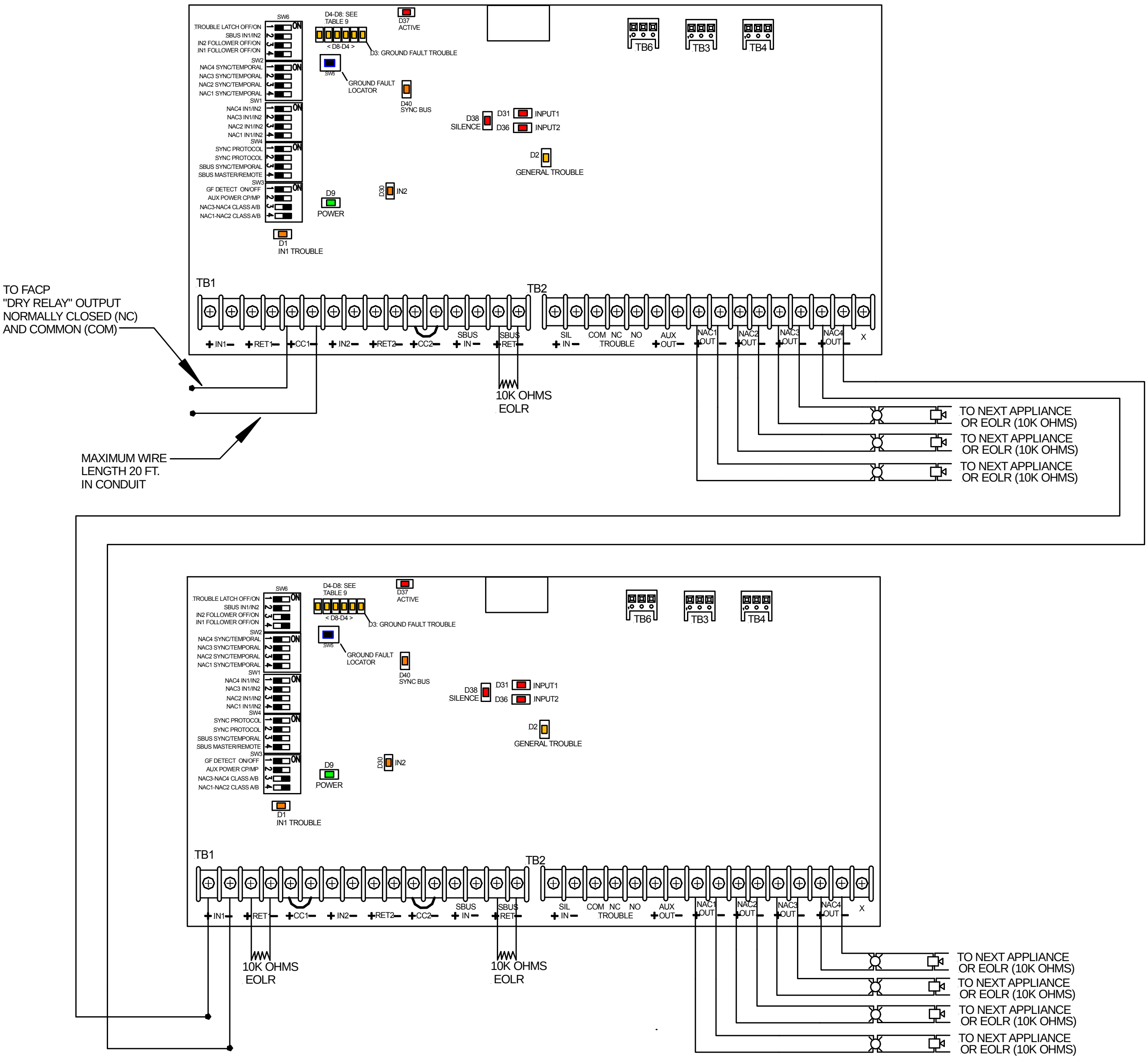
Example 11: NAC STROBES ACTIVATED SEPERATELY, with all circuits synchronized



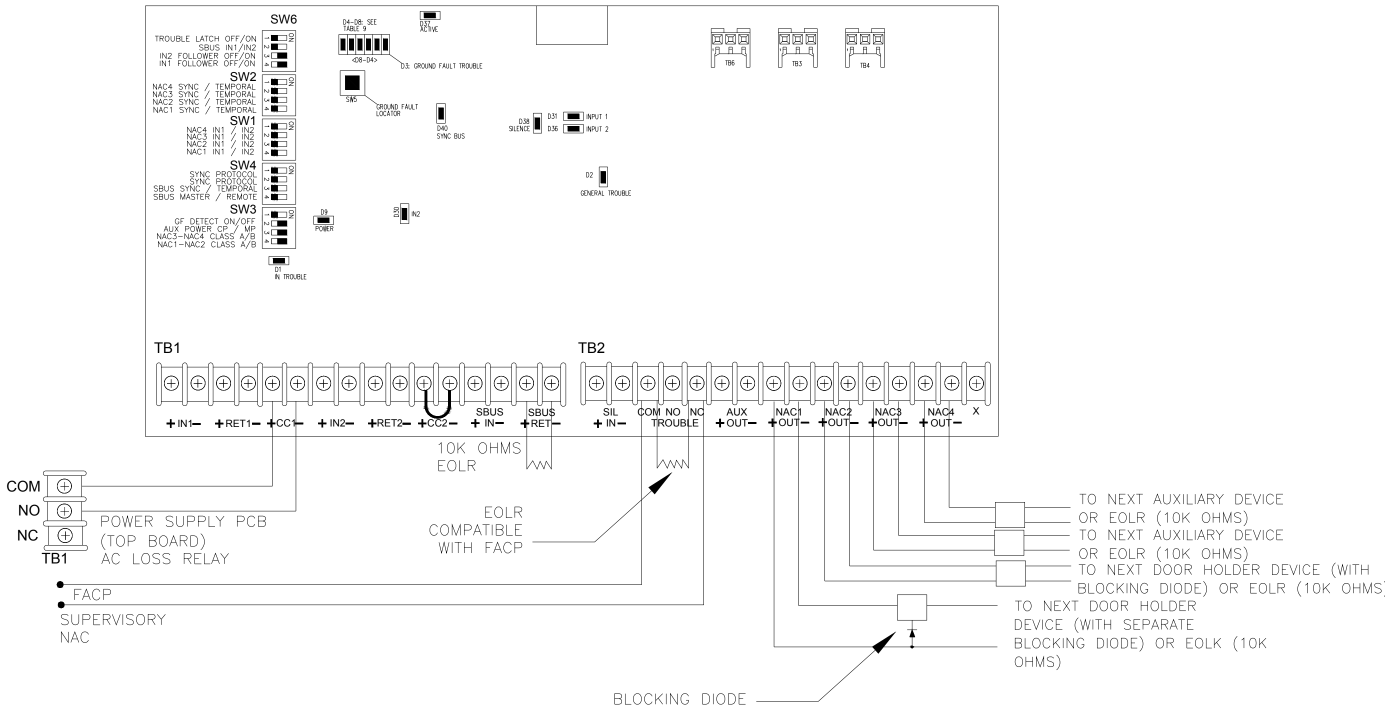
Example 12: NAC HORNS ACTIVATED SEPARATELY, with all circuits synchronized



Example 13: NAC APPLIANCES SYNCHRONIZED all at the same time



Example 14: NON-RESETTABLE POWER APPLICATION



- If door holder does not include an integrated diode one must be added to each door holder as shown in Example 14.
- Ensure that JP1 is installed on the Power Supply PCB (The top pc board.)
- The maximum current rating for a NAC OUT circuit is 3.0 Amps.
- The maximum current rating for all NAC OUTS must not exceed 4.0 Amps.
- For a List of Compatible Auxiliary Devices see table in Section 8.0 on sheet 33.

NOTE: Continuous duty power supply outputs ARE NOT battery backed up. These outputs will TURN OFF if AC Mains power is lost. These outputs will AUTOMATICALLY TURN ON when AC Mains power is restored.

⚠**WARNING: OUTPUTS CONFIGURED AS "CONTINUOUS DUTY POWER SUPPLY OUTPUTS" WILL NOT SYNCHRONIZE STROBES.**

7.0 BATTERY CALCULATION SHEET

7.1 PS-8 BATTERY CALCULATION SHEET

STANDBY CURRENT CALCULATIONS:

1. The Standby Current for the PS-8 is 0.129 Amps. __________ Amps
   ***Note: If the PS-EXP is installed in the PS-8, use 0.164 Amps for Standby current.**

2. If this unit is set for Master Mode, multiply the number of remote units by 0.006 Amps. __________ Amps
   If this unit is set for Remote Mode, enter 0 Amps.

3. If you are using AUX in CP Mode, enter the current draw. __________ Amps
   If this unit is set for AUX MP Mode, enter 0 Amps.

4. Add Steps 2 and 3 together: __________ Amps
   The maximum current available for AUX CP and Master Mode SYNC BUS is.
   (For 24 hour standby time, up to 0.240 Amps maximum – using 12 Ahr batteries)
   (For 60 hour standby time, up to 0.020 Amps maximum – using 12 Ahr batteries)
   (For 72 hour standby time, up to 0.020 Amps maximum – using 33 Ahr batteries)
   (For 24 hour standby / 30 min. alarm, up to 0.110 Amps maximum – using 12 Ahr batteries)

5. Add Steps 1 and 4 together. __________ Amps

6. Multiply Step 5 by the required standby time in hours. __________ Ahrs
   For 24 hour standby time, enter 24, for 60 hour standby time, enter 60.

ALARM CURRENT CALCULATIONS:

1. Fill out the chart below to determine Alarm Current requirements.

Appliance Name	Appliance Type	Appliance Current Draw	Quantity	Total Current Draw
PS-8*	NAC Extender	0.129 Amps*	1	0.129 Amps*
			Total Alarm Current Draw:	

***NOTE: If a PS-EXP Board is used use 0.184 Amps in the PS-8 "Total Current Draw" box.**

2. Multiply the Total Alarm Current Draw by the amount of Alarm time required. __________ Ahrs
   For 5 Minutes of Alarm, multiply by 0.083 Hours.
   For 30 Minutes of Alarm, multiply by 0.5 Hours.

BACKUP BATTERY TOTAL REQUIREMENTS:

1. Add STANDBY CURRENT CALCULATION Step 6 with ALARM CURRENT CALCULATION Step 2. __________ Ahrs

2. Multiply BACKUP BATTERY TOTAL REQUIREMENTS Step 1 by 1.2 for a 20% Safety Margin. __________ Ahrs
   This is the minimum size battery needed, rated in Amp-Hours (Ahrs) for your application.

7.2 PS-6 BATTERY CALCULATION SHEET

STANDBY CURRENT CALCULATIONS:

1. The Standby Current for the PS-6 is 0.129 Amps. __________ Amps
***Note: If the PS-EXP is installed in the PS-8, use 0.164 Amps for Standby current.**

2. If this unit is set for Master Mode, multiply the number of remote units by 0.006 Amps. __________ Amps
If this unit is set for Remote Mode, enter 0 Amps.

3. If you are using AUX in CP Mode, enter the current draw. __________ Amps
If this unit is set for AUX MP Mode, enter 0 Amps.

4. Add Steps 2 and 3 together: __________ Amps
The maximum current available for AUX CP and Master Mode SYNC BUS is.
(For 24 hour standby time, up to 0.075 Amps maximum – using 7 Ahr batteries)
(For 60 hour standby time, up to 0.020 Amps maximum – using 12 Ahr batteries)
(For 72 hour standby time, up to 0.020 Amps maximum – using 33 Ahr batteries)
(For 24 hour standby time / 30 min. alarm, up to 0.150 Amps maximum – using 12 Ahr batteries)

5. Add Steps 1 and 4 together. __________ Amps

6. Multiply Step 5 by the required standby time in hours. __________ Amps
For 24 hour standby time, enter 24, for 60 hour standby time, enter 60.

ALARM CURRENT CALCULATIONS:

1. Fill out the chart below to determine Alarm Current requirements.

Appliance Name	Appliance Type	Appliance Current Draw	Quantity	Total Current Draw
PS-6*	NAC Extender	0.129 Amps*	1	0.129*
			Total Alarm Current Draw:	

***NOTE: If a PS-EXP Board is used use 0.184 Amps in the PS-8 "Total Current Draw" box.**

2. Multiply the Total Alarm Current Draw by the amount of Alarm time required. __________ Ahrs
For 5 Minutes of Alarm, multiply by 0.083 Hours.
For 30 Minutes of Alarm, multiply by 0.5 Hours.

BACKUP BATTERY TOTAL REQUIREMENTS:

1. Add STANDBY CURRENT CALCULATION Step 6 with ALARM CURRENT CALCULATION Step 2. __________ Ahrs

2. Multiply BACKUP BATTERY TOTAL REQUIREMENTS Step 1 by 1.2 for a 20% Safety Margin. __________ Ahrs
This is the minimum size battery needed, rated in Amp-Hours (Ahrs) for your application.

8.0 LIST OF COMPATIBLE AUXILIARY DEVICES

LIST OF COMPATIBLE AUXILIARY DEVICES	
For use with AUX CP MODE ONLY	
Manufacturer	Model
GE/EST	SD-4WJ/ESD-4WJ
BOSCH	D285DH
	D282A/D283A
FIRELITE	MMF-300
	CMF-300
	CRF-300
SPACE AGE	SL-2000
	SM-501
GENTEX	8000/8003
SYSTEM SENSOR	4WTAB
	4WTARB
	4WITARB
	4WTRB
	4WTB
	DH100ACDCLP
	R-10T Multi Voltage Relay
	R-20T Multi Voltage Relay
For use with AUX MP MODE or CONTINUOUS POWER	
Manufacturer	Model
LCN	SEM1960
	SEM78020/7820
GE/EST	DHFM12412
	DHFM22412
	DHFM11224
	DHFM21224
	DHF24120C
	DHS24120C
	DHR24120C
	1501-AQN5
	1502-AQN5
	1504-AQN5
	1505-AQN5
	1508-AQN5
	1509-AQN5
BOSCH	D370
	D371

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9.0 WARRANTY STATEMENT:

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10.0 LIST OF COMPATIBLE NAC DEVICES:

APPENDIX A

The following is a list of appliances produced by Cooper Wheelock that are compatible with the Wheelock power supplies.

SYNCHRONIZING HORNS	
AH-12	AH-24
AH-12WP	AH-24WP
HS-24	MIZ-24S
NH-12/24	HN/HN-C
ZNH	-----------
SYNCHRONIZING HORN STROBES	
AS-121575W	AS-241575W
AS-24MCW	AS-24MCC
AS-24MCWH	AS-24MCCH
AS-2415C	AS-2430C
AS-2475C	AS-24100C
ASWP-2475W	----------
NS4-121575W	NS-121575W
HS4-241575W	NS-2-41575W
HS4-24MCW	NS-24MCW
HS4-24MCWH	HS4-24150C
HS/HS-C	----------
----------	----------
HS4-24185W	----------
ZNS-MCW	----------
ZNS-MCWH	----------
SYNCHRONIZING STROBES	
RSS-121575W	RSSP-121575W
RSS-241575W	RSSP-241575W
RSS-24MCW	RSSP-24MCW
RSS-24MCC	----------
RSS-2415C	----------
RSS-2430C	----------
RSS-2475C	----------
RSS-24100C	----------
RSS-2415CR	----------
RSS-2430CR	----------
RSS-2475CR	----------
RSS-24100CR	----------
RSS-24150C	----------
RSS-24177C	----------
RSS-24150W	RSSP-24150W
RSS-24177W	RSSP-24177W
RSS-24185W	RSSP-24185W
RSS-24150CR	----------
RSS-24177CR	----------
RSSWP-2475W	----------
ZRS-MCW	----------
ZRS-MCWH	ST/ST-C

APPLIANCES WITH SYNCHRONIZING STROBES	
AMT-241575W	AMT4-241575W
AMT-2475W	AMT4-2475W
AMT-241575W-NYC	AMT4-241575W-NYC
AMT-2475W-NYC	AMT4-2475W-NYC
MT-12575W	----------
MT-241575W	MT-2475W
MTWP-2475W	ET70WP-2475W
CH70-24MCW	CH90-24MCW
CH70-24MCC	CH90-24MCC
CH70-2415C	CH90-2415C
CH70-2430C	CH90-2430C
CH70-2475C	CH90-2475C
CH70-24100C	CH90-24100C
CH70-24150C	CH90-24150C
CH70-24177C	CH90-24177C
CH70-24150W	CH90-24150W
CH70-24MCWH	CH90-24MCCH
CH70-24185W	CH90-24185W
E70-24MCW	E90-24MCW
E70-24MCC	E90-24MCC
E70-2415C	E90-2415C
E70-2430C	E90-2430C
E70-2475C	E90-2475C
E70-24100C	E90-24100C
E70-24150C	E90-24150C
E70-24177C	E90-24177C
E70-24150W	E90-24150W
E70-24MCWH	E90-24MCCH
E70-24185W	E90-24185W
ET70-24MCW	ET90-24MCW
ET70-24MCC	ET90-24MCC
ET70-2415C	ET90-2415C
ET70-2430C	ET90-2430C
ET70-2475C	ET90-2475C
ET70-24100C	ET90-24100C
ET70-24150C	ET90-24150C
ET70-24177C	ET90-24177C
ET70-24150W	ET90-24150W
ET70-24MCWH	ET90-24MCCH
ET70-24185W	ET90-24185W
SA-70-24-SL	SA-90-24-SL
SA-70-24-SLM	SA-90-24-SLM
CODED AUDIBLE APPLIANCES	
AMT-12/24	AMT4-12/24
AMT-12/24-NYC	AMT4-12/24-NYC
CH70	CH90
CSX10-24-DC	CSXG10-24-DC
MT-12/24	MT4-12/24
NON-SYNCHRONIZING APPLIANCES	
MB-G6-12	MB-G6-24
MB-G10-12	MB-G10-24
MIZ-TC12	MIZ-TC24